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Maxwell Wins Trophy

Short Events Are Won by Peugeots—Limberg Killed

By J. Edward Schipper

ONCE again America has triumphed in the arena of speed. Eddie Rickenbacher, driving his Maxwell car at a pace of over 96 m.p.h., won the Metropolitan cup classic at Sheepshead Bay against a field of the best that the world could do in speed and endurance.

Close behind the Yankee winner came Jules Devigne in a Delage, one of the products of engineering skill of France. Less than 2 min. behind the winner he had covered the cruel course at over 94 m.p.h., having fought every inch of the way in the relentless struggle.

And, most remarkable of all, a car which two short weeks ago was attached to a touring body and was acting as a demonstrator came across the line in third position, just 5 min. and 13 sec. behind the winner. This was Ira Vail in a Hudson.

Popular as was the victory of Eddie Rickenbacher in his milk-white Maxwell, it was not without a touch of sadness. Carl Limberg and his mechanician, R. Pallotti, who were leading the race at the thirtieth mile in a Delage car, were both killed almost instantly by an

Metropolitan Trophy, 150 Miles

Car	Driver	Time	M.P.H.	Prize
Maxwell	Rickenbacher	1:33:31	96 23	$6,000
Delage	Devigne	1:35:11	94 56	3,500
Hudson	Vail	1:38:44	91.0	2,000
Duesenberg	Devlin	1:43:04	87.4	1,500
Adams Special	Adams	1:51:00	81.0	1,000

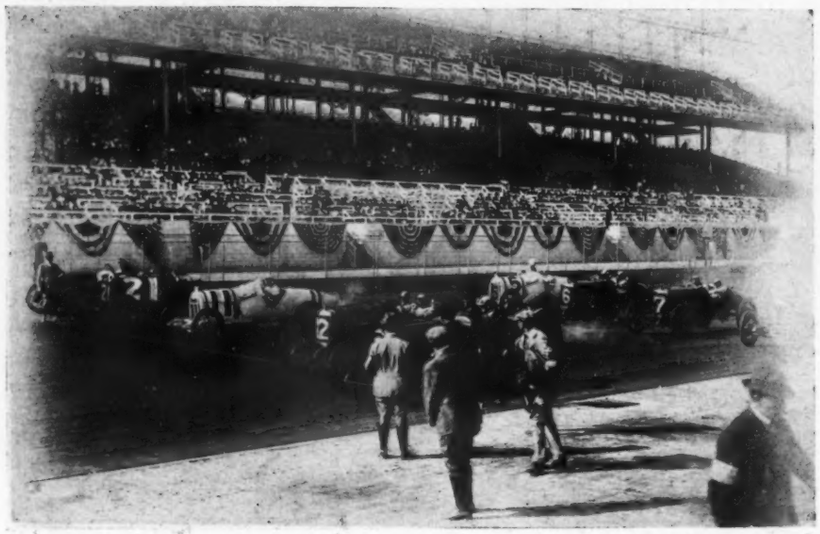
Queens Cup, 50 Miles

Peugeot	Mulford	28:45:04	101.34	$1,000
Duesenberg	Devlin	30:15:98	99.11	600
Peusun	Franchi	30:16:26	99.09	400
Delage	Limberg	31:35:30	94.5	300

Coney Island Cup, 20 Miles

Peugeot	Aitken	11:15:8	106.71	$600
Sunbeam	Christiaens	11:26:52	104.77	350
Delage	Limberg	11:27:6	104.55	250
Maxwell	Rickenbacher	11:27:6	104.55	200
Maxwell	Henderson	11:56:17	100.50	100

Rickenbacher in his Maxwell after winning 150-mile Metropolitan Trophy



Line up of the cars for the 50-mile Queens Cup race. Aitken has the pole, with Franchi, Rickenbacher, Vail and Mulford in the front row. Behind are Devlin, Devigne, Limberg and Henderson

accident occurring on the steeply banked curve just before entering the home stretch. Limberg had led the field from the start until Eddie Rickenbacher, who eventually won, and two others passed him on the back stretch. Urging his speedy mount to a pace of over 104 m.p.h. to regain his place, Limberg took the steeply-banked curve without hesitation. Then, just as he had reached that part of the curve at which the drivers prepare to straighten out to enter the home stretch, his right rear tire blew out, causing his car to waver and strike the fence at the topmost point of the banked turn. A wrench of the steering wheel brought the car momentarily back on the track but it was out of control and immediately struck the fence again a few feet beyond, pitching both driver and mechanician out over the edge while the car itself, broken in many parts, rolled down the steep side of the saucer a mass of fractured metal, flame and dense black smoke. Death came to both men almost instantaneously.

Aitken Breaks 20-Mile Record

Two shorter events preceded the 150-mile Metropolitan Trophy race, one of 20 miles for the Coney Island cup and a list of prizes starting at $600 for first and ending at $100 for fifth. This was won at a pace which makes a new world's record. Johnnie Aitken hurled his Peugeot ten times around the 2-mile track at a speed of 106.54 m.p.h., requiring but 11 min. and 15 sec. to cover the distance. Second in this was Joseph Christiaens in the Sunbeam six who crossed the line 6 sec. behind the winner. One second behind Christiaens was Carl Limberg in the ill-fated Delage car.

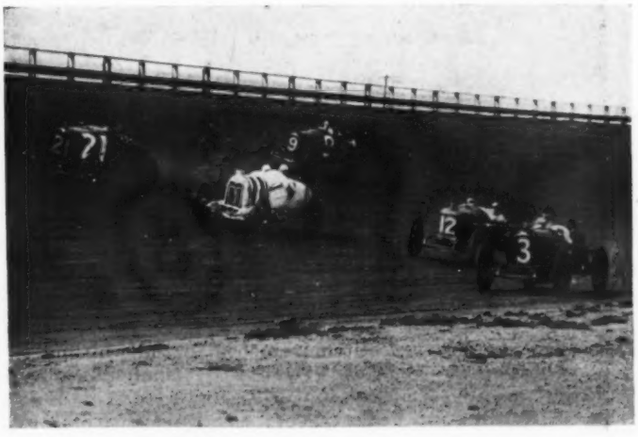
The second of the shorter events was the Queens Cup, a 50-mile race in which the first prize was $1,000. Ralph Mulford broke through his streak of bad luck long enough to win this at an average speed of 104.34 m.p.h. Twenty-eight minutes and 45 sec. were needed to cover the course. Second in this event was C. F. Devlin in a Duesenberg car and third a combination of a Peugeot chassis and a Sunbeam motor known as the Peusun driven by Alde Franchi.

Perfect Day for Race

A WARM sun tempered by a breeze from the bay afforded perfect weather for the race. It was about 2 o'clock in the afternoon when the stands began to rapidly fill with spectators and by 3 o'clock when the first race started the crowd of 25,000 presented a vari-colored picture which, from a distance, looked for all the world like an animated rag carpet. The events were opened by the graceful flights of a young girl aeronaut in a biplane who entertained the vast crowd by gracefully-executed spiral dips, loops and upside down flights.

Aeroplane Flights First

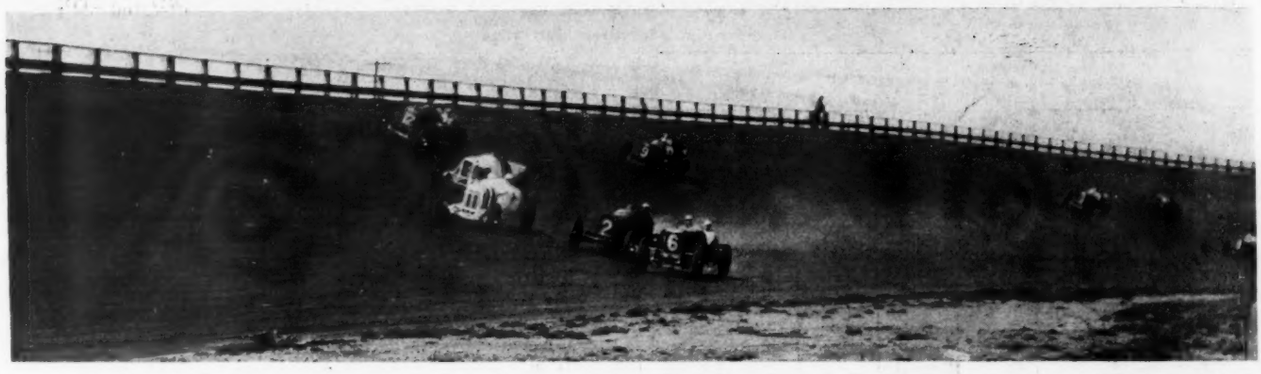
Around the board ellipse she flew while the drivers were lining up their equally fast but earth-confined mounts along the starting line.



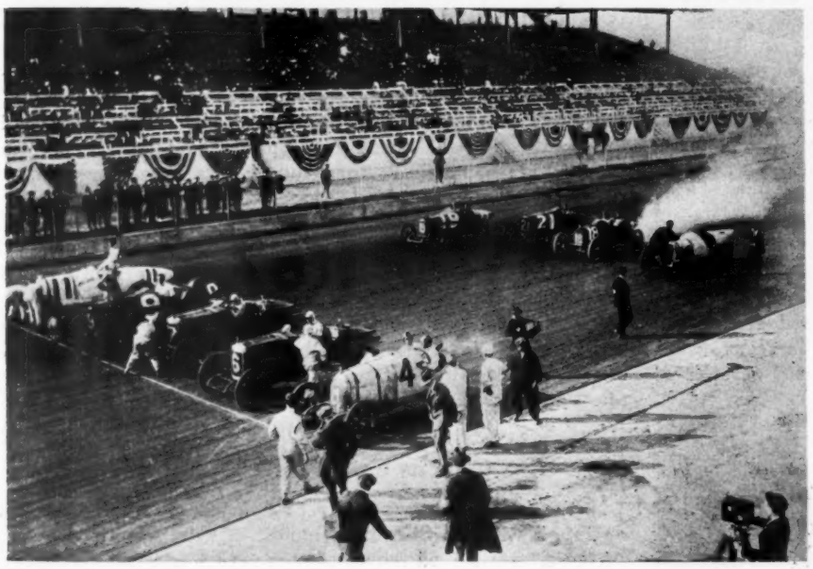
One of the brushes in the Metropolitan Trophy race. Rickenbacher is taking the lead, passing Vail and Mulford just behind. Franchi and Aitken following close to the pole

Position by Lap of Each Car and Driver in the 150-Mile Race for the Metropolitan

Car	Driver	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32
Maxwell	Rickenbacher	3	5	5	5	5	5	5	5	4	4	4	4	4	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Delage	Devigne	2	2	4	4	3	4	4	4	3	3	3	3	3	3	3	4	4	3	3	3	3	4	4	3	3	4	4	4	4	4	4	4
Hudson	Vail	7	8	8	8	9	8	8	8	7	8	8	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	5	5	5	5	5	5
Duesenberg	Devlin	4	3	6	6	6	6	6	6	5	5	5	5	5	5	4	3	3	4	4	4	4	3	3	4	4	3	3	3	3	3	3	3
Adams	Adams	8	9	9	9	9	9	9	9	8	7	7	8	8	8	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	3	6
J.J.R. Special	Watson	10	10	10	10	10	10	10	10	9	9	9	9	9	9	8	8	8	8	8	8	8	8	8	8	8	8	7	7	7	7	7	7
Peugeot	Resta	5	4	2	3	4	3	3	2	1	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Peusun	Franchi	9	7	7	7	7	7	7	7	6	6	6	6	6	6	5	5	5	5	5	5	5	5	5	5	5	5	out					
Delage	Limberg	1	1	1	1	1	1	1	3	2	1	1	1	1	1	out																	
Peugeot	Mulford	6	6	3	2	2	2	2	1	out																							



In the second lap of the Metropolitan Trophy race with Rickenbacher, Franchi and Watson followed by Lewis, Mulford and Limberg



Start of the 150-mile race with J. J. R. Special, Limberg's Delage, Devigne, Mulford and Rickenbacher in the front row and Franchi, Devlin, Adams, Vail and Resta behind

It was just 3 o'clock, lacking 2 min., when Fred Wagner started the thirteen entries around the track for a rolling start in the 20-mile event. Even then, the superstitious were shaking their heads as they counted the cars lined up across the track, but all superstition vanished in the whirling excitement as the cars flashed away on the 20-mile sprint. A 108-mile pace was immediately set up as Mulford's Peugeot took the lead in the first lap. Aitken, his team mate, was close behind followed by Rickenbacher in the Maxwell, then Devigne in the Delage, Limberg in another Delage and the hybrid Peusun with Franchi in sixth place. Christiaens' Sunbeam trailed along in seventh position.

Almost before the spectators had time to note the relative positions of the cars they were around again with Mulford still in the lead trailed by his team mate Aitken. These two were 300 yd. in advance of a group of five cars made up of Rickenbacher's Maxwell, Limberg's Delage, Devigne's Delage, Christiaens' Sunbeam which was now in sixth place having passed the Peusun which was seventh.

The third lap saw the two Peugeots with Mulford and Aitken an eighth lap ahead. Third place was still being held by Rickenbacher in the Maxwell and fourth place by Christiaens in the Sunbeam who had forged ahead of Limberg's Delage and Devigne's Delage. In the fourth lap Mulford and Aitken were increasing their lead, they were now almost a quarter lap before a group of three cars consisting of Limberg's Delage, Christiaens' Sunbeam and Rickenbacher's Maxwell. The other cars were trailing.

On the fifth lap the two leading Peugeots lapped the Adams Special directly in front of the stand. The group of three pursuers were still one-quarter lap behind the leaders with Christiaens in his Sunbeam back in fifth position. Thus they spun around the saucer, with the two Peugeots flying like hawks in advance of the field, followed a quarter lap behind by the group of three cars until in the seventh lap Christiaens began to creep up on the two flying Peugeots bringing his car into third position.

It was at this point that the break in the race came. Mulford had to stop for a tire and when, after making a quick change, he sought to again enter the race, his engine could

Trophy Held on the Sheepshead Bay Motor Speedway, Saturday, May 13

33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
2	2	2	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1
4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	
5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3
3	3	3	3	3	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4
6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	7	7	7	7	7	7	6	6	6	6	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	6	6	6	6	6	6	7	7	7	7	6	6	6	6	6	6	6	6	6	6	6	6	6	out			
1	1	1	2	2	2	2	2	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	out																

Times of the Cars and Drivers at Various Periods in the 150-Mile Race for the Metropolitan Trophy

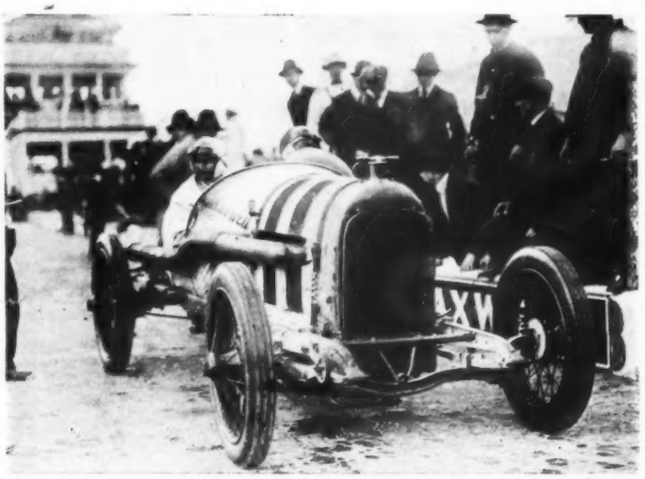
Time for distance expressed in miles

Car	Driver	2	4	6	8	10	20	40	60	80	100	120	140	150
Maxwell	Rickenbacher	1:20	2:31	3:41	4:49	6:00	11:47	23:34	35:36	47:41	1:2:12	1:14:45	1:27:14	1:33:31
Delage	Devigne	1:19	2:30	3:41	4:50	5:59	11:46	24:28	38:32	50:34	1:2:38	1:14:40	1:29:16	1:35:11
Hudson	Vail	1:26	2:45	4:20	5:22	6:42	13:15	30:20	39:33	52:46	1:5:55	1:19:40	1:32:18	1:38:44
Duesenberg	Devlin	1:20	2:31	3:42	4:52	6:50	12:12	24:29	36:36	51:70	1:3:23	1:15:50	1:31:20	1:43:03
Adams	Adams	1:28	2:48	4:50	5:22	6:41	13:15	29:26	40:00	54:52	1:10:08	1:25:40	1:42:32	1:51:00
J.J.R	Watson	1:31	2:59	4:26	5:53	7:21	14:34	25:58	40:70	54:26	1:11:32	1:35:12	1:51:10	flagged
Peugeot	Resta	1:21	2:31	3:40	4:50	5:59	11:45	23:34	35:36	49:20	1:01:58	1:10:56	time for 58	laps retired
Peusun	Franchi	1:30	2:44	4:20	5:21	6:41	12:50	25:27	33:31	time for 25	laps retired			
Delage	Limberg	1:19	2:29	3:38	4:47	5:56	11:45	16:21	time for 14	laps retired				
Peugeot	Mulford	1:22	2:32	3:40	4:49	5:58	*10:51							

*Time for ninth lap; stopped and retired.

not be started. Glancing beneath his car a pool of gasoline could be seen and examination showed that a bolt had fallen from the carbureter, rendering necessary many precious seconds before it could be repaired. With this race a short sprint of 20 miles, it was hopeless for Mulford to go back, so he saved his car and strength for the next race. This left Aitken in the lead with Christiaens second and Limberg third followed by Rickenbacher in the Maxwell. These positions were held until the end.

Had the race lasted another lap it is doubtful if Christiaens could have finished. His engine faltered even as he crossed the finishing line and as he drew up in front of his pit he turned his car over to his attendants with a shake of the head signifying the doubt that was in his heart. Examination showed that the pulley wheel mounted on the end of the camshaft intended to drive the dash tachometer had broken through the housing and allowed oil to escape from the crankcase. This in turn caused seized bearings, which ended the activities of the Sunbeam car for the day.



Above—Rickenbacher's Maxwell, which won the 150-mile race. Below—Vail's Hudson, which finished third in that race without making a single stop at the pits

Chandler Out on First Lap

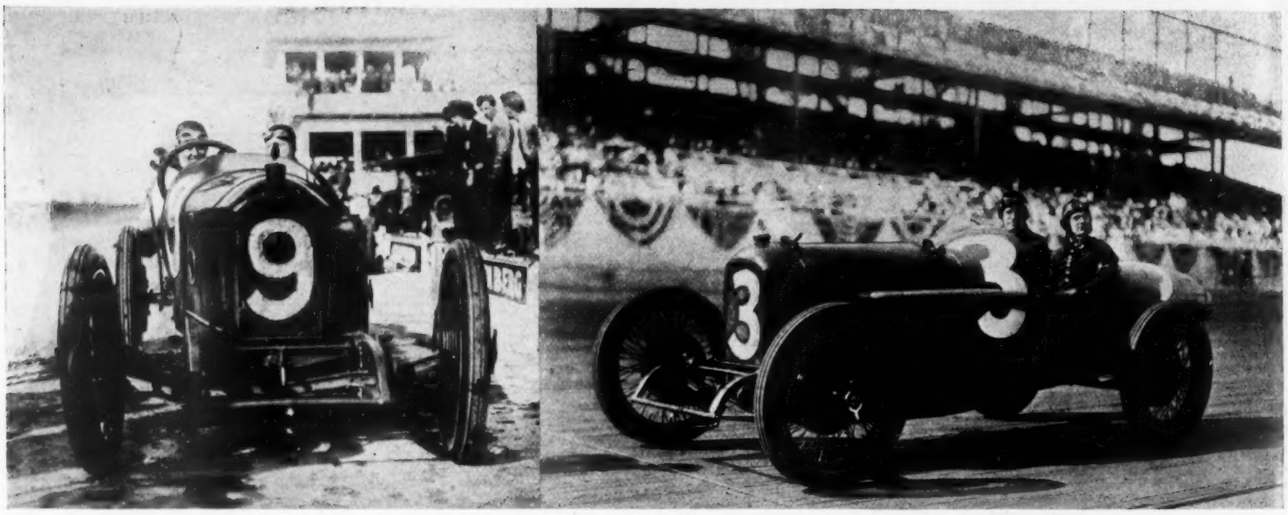
Bill Chandler in the Crawford Special was another one whose ill fortunes came early. Chandler completed just one lap in the first event and was no longer a factor in the day's program. A piston seized and broken at the very start ended all the activities of this favorite of the speed world until he pilots his mount in the events at Indianapolis.

Queens Cup Race 50 Miles

IN the interval between the 20-mile race and the Queens Cup, Katharine Stinson, a bundle of feminine courage of 20 years, entertained the spectators with some brilliant flying in a biplane. With two thin trails of smoke flying from the outer extremities of the wings of her air machine Miss Stinson drew figures of spirals and loops across the sky over the Sheepshead track.

Nine cars lined up before the judges' stand for the 50-mile event. This was started in the same way as the shorter race with a rolling start and all realized that the distance meant another sprint with better than 100 m.p.h. average to win. As the cars burst across the starting line Aitken's Peugeot, which had shown itself the fastest in the shorter race, again leaped forward to claim first honors, and at the end of the first lap the numbers 3 and 9 held respectively by Aitken and Mulford repeated the feat of holding the lead. The end of the first lap found Aitken and Mulford just ahead of Limberg in his Delage and Rickenbacher in the Maxwell. The next lap was covered in the same order with Henderson's Maxwell fifth, Devlin's Duesenberg sixth and Devigne's Delage seventh. Trailing behind were Franchi in the Peusun and Ira Vail in the Hudson. So close were the leaders to each other that the guidon of speed passed from hand to hand with Limberg in the Delage ahead at the end of the third lap. Aitken's Peugeot was now second with Mulford close behind in third position and Rickenbacher fourth.

The three leaders with their Nos. 6, 3 and 9 kept running around the track as regularly as clockwork through the interval between the third and thirteenth laps. The struggle for fourth place between Devlin in the Duesenberg and Devigne in the French Delage was keen until in the fifteenth lap when Mulford's Peugeot flashed to the front with Aitken in second place and Devigne's Delage in third, Devlin in the Duesenberg lodged himself safely in fourth place. Mulford



Left—Ralph Mulford in his Peugeot, which won the 50-mile Queens Cup race. Right—John Aitken's Peugeot, which won the 20-mile race in world's record time

was never again passed. Devlin crept up gradually holding third until the twentieth lap when he was passed by Franchi in the Peusun who had fought his way gamely all the way up from eighth place which he held in the second lap. The breaking point came for second place in the twenty-first lap when Aitken's Peugeot had to drop out with a burned-out bearing. Devigne's Delage which had been running fifth went out for good immediately afterwards for a second tire change which he realized destroyed his chances of finishing in the money. The four to finish were Mulford in the Peugeot first; Devlin, Duesenberg, second; Franchi, Peusun, third; Limberg, Delage, fourth.

Position Table of the 20-Mile Race for the Coney Island Cup

Car	Driver	1	2	3	4	5	6	7	8	9	10
Peugeot	Aitken	2	2	2	2	2	2	2	1	1	1
Sunbeam	Christiens	8	7	5	4	5	5	3	3	2	2
Delage	Limberg	5	4	3	3	3	3	4	4	3	3
Maxwell	Rickenbacher	3	3	4	5	4	4	5	5	4	4
Maxwell	Henderson	9	8	8	9	8	7	7	7	6	5
Delage	Devigne	4	5	6	6	6	6	6	6	5	6
Duesenberg	Devlin	6	9	9	7	7	8	8	8	7	7
Peusun	Franchi	7	6	7	8	9	9	9	9	8	8
Crawford	Lewis	10	10	10	10	10	10	10	10	9	9
Hudson	Vail	11	11	11	11	11	11	11	11	11	
Peugeot	Mulford	1	1	1	1	1	1	1	2	out	
Adams	Adams	12	12	12	12	12	out				
Crawford	Chandler	16	out								

Metropolitan Trophy Race—150 Miles

WITH the two short events over, the great crowd settled back with an air of expectancy to await the crowning affair of the day. This was to be a race of 150 miles for the Metropolitan trophy and a total of $15,000 in prize money. The winner was to secure $6,000 in cash with $3,500 for second place, $2,000 for third and graduated amounts down to $400 for seventh.

There were ten starters in this main event. Like greyhounds straining at their leashes as if it were with difficulty that they could be restrained from starting on their arrow-like whirl, they awaited the starter's word. Just shortly after 4 o'clock they were sent on their way for a flying start and crossed the line with a roar as they steadily gathered speed in a determined dash for a complete century and half another.

The slower of the cars had maximum speeds of close to 95 m.p.h. The fastest had speeds which none could tell as even the daring drivers hesitated to trust the masses of superfine steel to the powerful impulses which could thrust them forward at 120 m.p.h.

Every driver knew the race his car could run, and each was prepared to secure from it the best that was possible. The slower cars relied upon the destruction of metal and rubber that would accompany the speed of the high-strung pacemakers while the fast cars struck a pace which they knew would safely win if it could be sustained for the dis-

Position Table for Each Lap of the Race for the 50-Mile Queens Cup

Car	Driver	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Peugeot	Mulford	2	2	3	3	3	3	3	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1	1	1	1
Duesenberg	Devlin	8	7	6	4	4	5	4	4	5	5	5	4	5	5	4	3	3	3	3	3	4	2	2	2	2
Peusun	Franchi	7	8	8	8	7	7	7	6	7	7	7	6	6	6	6	5	4	4	4	4	3	3	3	3	3
Delage	Limberg	4	3	1	1	1	1	1	1	1	1	1	1	1	2	7	7	7	6	6	6	6	4	4	4	4
Delage	Devigne	6	6	7	6	5	4	5	5	4	4	4	5	4	4	3	4	6	7	7	7	6	5	out		
Peugeot	Aitken	1	1	2	2	2	2	2	2	2	2	2	2	2	1	2	2	2	2	2	2	2	out			
Maxwell	Henderson	5	5	5	5	6	6	6	7	6	6	6	7	7	7	5	6	5	5	5	out					
Maxwell	Rickenbacker	3	4	4	9	9	9	8	out																	
Hudson	Vail	9	9	9	7	8	8	out																		

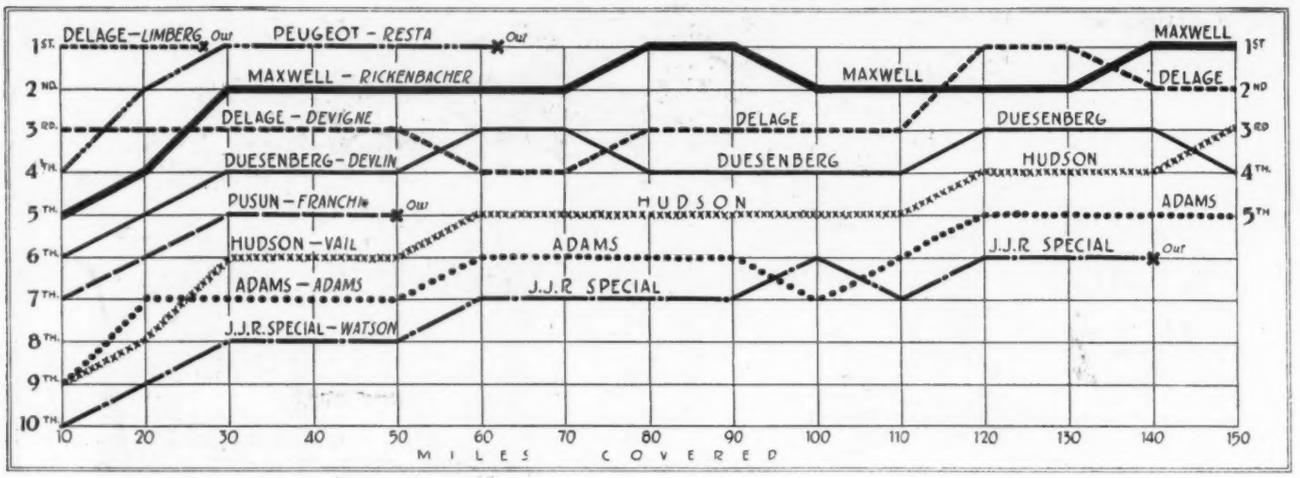


Chart showing the changes in the relative positions of each car in the 150-mile Metropolitan Trophy Race

tance. It was a compromise with them between speed and material with the nerve of the driver and ability to hold his mount in control, taken for granted.

First to seize the lead in this event was Limberg in the Delage. The end of the first lap found him opening his space between the tail of his flying Delage and the radiator of Devigne in another car of the same make. Rickenbacher's Maxwell was third and Devlin's Duesenberg fourth.

Hot Pace Begins to Tell

Immediately the pace began to tell, and shifting positions among the leaders occurred. Limberg's Delage, however, was ever to the fore closely followed in the third lap by Resta and Mulford in their Peugeots. These cars set the pace. Close together they remained with Devigne in his Delage always struggling to be among the first three. He held this cherished position in the fifth lap but lost it again in the sixth and the order maintained until the end of the seventh lap was, with this momentary exception, Limberg, Mulford, Resta, Devlin and Rickenbacher. At the eighth round the two flying Peugeots nosed ahead of Limberg's Delage putting him into third place, but here the hot pace had its first telling effect when Mulford was forced to abandon the race with a broken piston head.

This left Resta in the lead in the ninth lap with Limberg second; Devigne, third; Rickenbacher, fourth; Devlin, fifth; Franchi, sixth, with Vail in the Hudson, Adams in the Adams Special and Watson in the J. J. R. trailing behind as seventh, eighth and ninth.

Resta's lead lasted but one lap as it was snatched away from him again by Limberg in the Delage. The Delages were proving to be fast as Devigne in his car was a close third and between these two French cars a hot pace was set. In the thirteenth lap a group of five cars was in the lead, the order being, Limberg, Resta, Devigne, Rickenbacher and Franchi. These were fully a half lap in front of the field and running at a speed which caused the spectators to prophesy well over 100 m.p.h. for the winner.

Limberg's lead was hotly contested. Resta, Devigne and Rickenbacher, closely pursuing, caught him on the back stretch after he had completed his fourteenth lap and then ensued one of the fastest sprints of the event. Danger was forgotten. None of the contestants thought of anything but the struggle for supremacy in the strife of speed. None would be first to obey the cry of caution to release to some slight degree the pressure of the foot on the accelerator pedal. Never did the gladiators of Rome battle better.

Up to this time there had been two stops at the pits, one on the ninth lap when Mulford was forced to abandon the race and one on the twelfth when the Adams Special had to change a right rear tire. Like meteors the speeding leaders were flying about the inverted dome but their positions varied from time to time as they fought for the key position. Limberg's gallant driving had won him a host of admirers and every time he passed the crowded stands he received a round of well-earned applause. But after he had passed his fourteenth lap and was soaring far up on the banked turn to enter the home stretch, the accident occurred which brought a chill to the hearts of the spectators and even caused the steel-nerved drivers to ease their pace until the average dropped below the hundred mark.

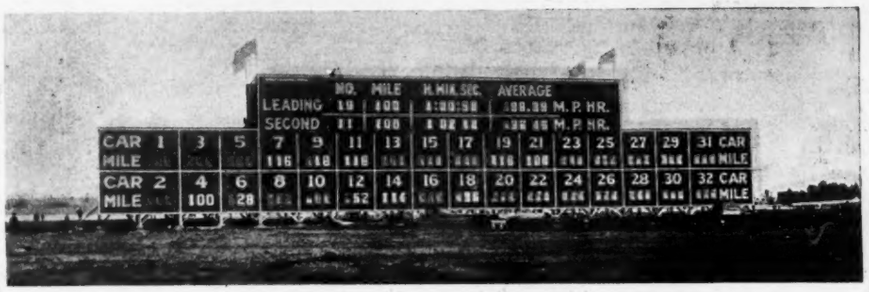
Resta Takes the Lead

With Limberg no longer in the race the burden of leadership passed to Resta, who held it in the teeth of the worrying pack of steel hounds who pursued him with unrelenting energy through many a weary mile between the fifteenth and thirty-fifth laps. All this time Rickenbacher in the Maxwell was in second place. A struggle for third and fourth was going on between Devigne and Devlin with Devigne holding third position in the twenty-fourth and twenty-fifth laps, Devlin holding it from the twenty-sixth to the thirty-seventh and then with third honors pass-

Whirlwind finish in the fight for second place in the 20-mile Coney Island Cup race. Christiaens crossed the line just ahead of Limberg and Rickenbacher

ing to Devigne again until the fifty-eighth lap when he crawled into second place when Resta was forced to drop out and Rickenbacher took the lead.

Vail in his Hudson climbed into third place, beating out Devlin's Duesenberg in the seventy-first lap. Up to this time he had been running fourth with Devlin third. Fifth place was taken by Adams in the Adams Special which had run a consistent race throughout. Both the Hudson and the Adams while not so fast as Resta's Peugeot and the other speed creations had proved the value of the great increased factor of safety due to maintaining a steady but not excessive speed. Standing before the pits were the line of cars which had suffered in the grind and each one has meant a lesson which is far broader than the loss of a prize and which should be interpreted into invaluable stepping stones in the advancement of the art. Each broken car should prove a foundation for greater reliability and the lessons learned in this race will not only have their effects on the speed paths throughout the country this year but should also leave their imprint on the family stock car.



The new scoreboard, which is much more legible than the one used last Fall

Handicap Race Postponed

A 10-mile handicap consolation race was scheduled to take place after the 150-mile Metropolitan trophy event. This was postponed indefinitely, however, out of respect for the death of Limberg and Pallotti. It is doubtful if it could have been run anyway, as darkness was beginning to spread over the track and the crowd was already leaving.

One of the features of the opening of the track for the 1916 season which was a great improvement over last fall is the new electrically-operated scoreboard. This was four or five times larger than the one used last year and could be read from the grandstand. It was a double-faced design so that the people in the bleachers on the back stretch could also read it. The scoreboard used during the 1915 season was blown down by the heavy gales during the winter. The new one has been placed in the center of the great ellipse.

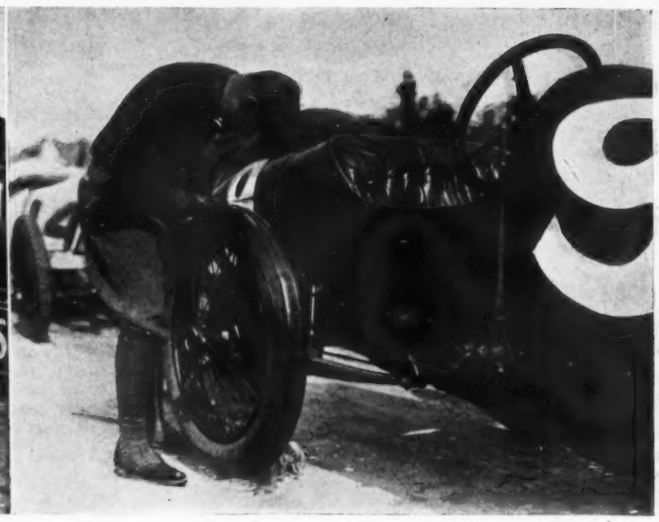
It was only due to the skillful handling of their cars by some of the other drivers that other accidents did not follow that in which Limberg lost his life. The ambulance surgeon who reached Limberg's car which was then in flames at the bottom of the incline surmised that the occupants had been thrown over the edge when he saw that the burning car was empty. One of those who had reached the scene with the ambulance made a dash up the side of the track and reached the top, but the ambulance surgeon failed to acquire enough momentum to carry himself to the top and started to slip backward in the path of the oncoming cars. He was rescued from his precarious position by being pulled up by the man who had preceded him. Another physician in the meantime had rushed out of the grandstand where he was occupying a place as a spectator, and jumping into his car, had driven around to the outside of the track where the accident had occurred. He was the first to reach the body of Limberg and found the mechanician still breathing. Pallotti died in the ambulance on the way to the hospital.

Devigne was 50 ft. behind Limberg when the accident occurred and swung down the track to avoid the wreck. He spun around three times on the concrete level before he succeeded in regaining control of his car.

Technical Details and Equipment of the Cars Taking Part in the Opening Program at the Sheepshead Bay Motor Speedway, May 13

Car	Driver	Mechanic	Cyl.	Bore	Stroke	Displ.	Carb.	Mag.	Plugs	No.	Pistons	Valve	Oil	Wheels	TIRES		Wheelbase	Shocks	Motometer
															Make	Size			
Delage	Limberg	Pallotti	4	94	160	274	Claudel...	Mea....	KLG....	4	Steel.....	Steel.... 16	Oilzum...	Rudge...	Silvert..	34x4½	106	Htfd.	Yes
Delage	Lecain	Moore	4	94	160	274	Zenith...	Bosch...	KLG....	4	Magnlum..	Steel.... 16	Oilzum...	Rudge...	Silvert..	34x4½	106	Htfd.	Yes
Delage	Devigne	Bellocchi	4	94	160	274	Claudel...	Mea....	KLG....	4	Steel.....	Steel.... 16	Oilzum...	Rudge...	Silvert..	34x4½	106	Htfd.	Yes
Peusun	Franchi	Ambroseo	4	94	160	274	Zenith...	Bosch...	KLG....	4	Steel.....	Steel.... 16	Oilzum...	Rudge..	Silvert.	34x4½	106	Htfd.	
Duesenberg	Devlin	Newgard	4	3½	6½	298.2	Miller....	Bosch...	Rajah...	8	Magnlum..	Tung... 16	Oilzum...	Rudge...	Silvert..	32x4½	106	Htfd.	Yes
Peugeot	Mulford	Stevens	4	3.6	6.6	274	Zenith...	Bosch...	Rajah...	4	Magnlum..	Tung... 16	Oilaum...	Rudge...	Silvert..	34x4½	106	Htfd.	Yes
Peugeot	Resta	Dahnke	4	3.6	6.6	274	Zenith...	Bosch...	KLG....	4	Magnlum..	Tung... 16	Oilzum...	Rudge...	Silvert..	34x4½**	106	Htfd.	Yes
Peugeot	Aitken	Becker	4	3.6	6.6	274	Zenith...	Bosch...	KLG	4	Steel.....	Steel.... 16	Oilzum...	Rudge..	Silvert..	34x4½	106	Htfd.	Yes
Maxwell	Rickenbacher...	Latta	4	3½	6½	298.2	Miller....	Bosch...	Rajah...	4	Magnlum..	Tung... 16	Oilzum...	Houk...	Silvert..	34x4½	106	Htfd.	Yes
Maxwell	Henderson.....	Clipping	4	3½	6½	298.2	Miller. ..	Bosch...	KLG....	4	Magnlum..	Tung.... 16	Oilzum...	Houk...	Silvert..	34x4½	106	Htfd.	Yes
J. J. R	Watson	Kintsch	4	3¹¹⁄₁₆	6	299	H. & N...	Bosch...	Bosch...	8	Magnlum..	Tung... 8	Mobiloil..	Rudge...	Silvert..	33x4½	101	Htfd.	Yes
Adams Spec	Adams	Edwards	4	3½	6½	298.2	Master...	Bosch...	Rajah...	8	Magnlum..	Tung... 16	Mobiloil..	Rudge...	Ther...	34x4½	100	Htfd.	Yes
Crawford Spec	Chandler	Johnson	4	3½	6½	298.8	Zenith...	Bosch...	Rajah...	8	Magnlum..	Tung... 16	Oilzum...	Rudge...	Silvert..	33x4½	106	Htfd.	Yes
Crawford Spec	Lewis	Alexander	4	3½	6½	298.8	Miller.. .	Bosch .	Rajah...	8	Magnlum..	Tung... 16	Oilzum...	Rudge...	Silvert..	33x4½	106	Htfd.	Yes
Erwin Forty	G. Bergdoll	H. Muller	4	4	5¹⁵⁄₁₆	298	Master...	Bosch...	Rajah...	8	Magnlum..	Tung.... 8	Mob-l B..	Rudge...	Silvert..	32x4½*	108	Htfd.	Yes
Erwin Forty	Stecher	Furrey	4	4	5¹⁵⁄₁₆	298	Master...	Bosch...	Rajah...	8	Magnlum..	Tung... 8	Mob-l B..	Rudge...	Silvert..	32x4½*	108	Htfd.	Yes
Sunbeam	Christiaens	Christiaens	6	81½	156	294	Claudel...	Bosch...	KLG....	6	Aluminum.	Steel.... 24	Oilzum...	Rudge...	Silvert..	35x5	113	Htfd.	
Hudson	Vail	Suederman	6	3½	5	288	Hudson..	Delco...	Rajah...	6	Iron.....	Tung.... 12	Veedol...	Rudge...	Silvert..	34x4½	104½	Htfd.	Yes

*33x5 tires rear **35x5 tires rear



Left—J. J. R. Special changing a tire at the pits. Right—Stevens trimming Mulford's tire in the intermission between races

Pit Work Shows Poor Preparation

Nine Tire Stops and Eleven Mechanical—Eight Cars Drop Out at Pits for Permanent Trouble

IF short races give more excitement to the spectators, they certainly make a pit stop strike a very stirring chord on the heartstrings of the drivers and mechanics. In the 20- and 50-mile events a stop at the pit was a sacrifice of place. Three stops were made during the 20-mile event and as the drivers glanced around they saw that this meant withdrawal and none of them re-entered.

During the course of the afternoon there were twenty stops altogether, and eight of these were permanent. Nine stops were made for tires, four in the 50-mile event and five in the 150-mile. The remainder were mechanical troubles and of these only three were of a sufficiently trifling nature to allow the contestant to go on with the race, the others being so serious that this was impossible.

Looking at the pit work from the standpoint of efficiency, it was far below par. The importance of well-drilled pit crews seemed to be but little realized and the result was that in many instances there was considerable bungling of important jobs and consequent loss of time. An example of this was shown in an instance of a tire change. It seems almost foolish to say that a pit crew should be well drilled in making tire changes and yet an instance where considerable time was lost because one of the pit hands endeavored to take a wheel off by turning the retaining nut in the wrong direction is only one of the cases where time was lost. After he had thoroughly jammed the threads it was only with the greatest difficulty that the nut was spun off at all.

Tabulation of Stops at Pits

20-Mile Event

Car	Driver	Lap No.	Time of Stop	Cause of Stop
Crawford Sp.	Chandler	1	Out	Piston seized and broken.
Adams Spec.	Adams	6	Out	Stripped driving splines on right axle shaft.
Peugeot	Mulford	7	Out	Connection between carbureter float chamber and mixing chamber broken.

50-Mile Event

Maxwell	Rickenbacher	7	20 sec.	Change right rear tire.
Maxwell	Rickenbacher	8	Out	Broken oil lead.
Delage	Limberg	12	30 sec.	Changed left rear tire.
Delage	Devigne	17	1:14	Changed right front tire.
Peugeot	Aitken	21	Out	Burned bearing.
Maxwell	Henderson	21	Out	Oil trouble, seized piston.
Delage	Devigne	22	1:	Changed right rear tire.

150-Mile Event

Peugeot	Mulford		Out	Piston head broken.
Adams Spec.	Adams		1:	Changed right rear tire.
Peusun	Franchi		Out	Broken connecting-rod.
Delage	Devigne		:40	Changed left rear tire.
J.J.R. Sp.	Watson		1:20	Gasoline and oil.
Peugeot	Resta		1:	Changed right rear tire.
Maxwell	Rickenbacher		1:55	No. 4 ignition cable broken.
Peugeot	Resta		Out	Cracked cylinder.
J.J.R. Sp.	Watson		:30	Misfiring, inspected ignition.
Delage	Devigne		2:	Right front tire, engine on fire.
J.J.R. Sp.	Watson		1:31	Right rear tire, inspected ignition.

Resta's Cylinder Cracked

Another instance was when Resta stopped to change his spark plugs. It happened that the real cause of this trouble was a cracked cylinder and eventually he found that he could not go on. But at any rate after the plugs had been changed and he was again in his seat he found that although he had signalled for water the pit attendants had waited until he was all through changing plugs before they removed the radiator cap.

Going over the list of troubles as indicated by pit stops, it appears that lubricating difficulties are still too numerous. The light pistons and high speeds have rendered the oil film a very important part of the car's bill of health. The very first car out which was on the first lap of the first event was troubled with a seized piston. A broken oil lead put Rickenbacher's car out in the 50-mile event and Henderson's Maxwell went out with a seized piston due to oil trouble in the same race. In all probability Mulford's Peugeot which went out in the ninth lap in the 150-mile event after having won the previous race was

troubled with this identical weakness.

Chandler Out at Start

In the first race Bill Chandler after making one lap had to withdraw his Crawford Special on account of a seized and broken piston. The Adams special went out in the sixth lap on account of stripping the driving splines in the right rear axle shaft and Mulford had to stop because a screw entering the nozzle passage of the carbureter became loose.

In the second, or 50-mile event, the first pit stop came when Rickenbacher brought his car in for the quickest tire change of the day. He was off in 20 sec. with a new right rear wheel. In his next lap, however, a broken oil lead forced him to stop until the next race.

Devigne's Delage took fire at the pits while changing a tire but the extinguisher brigade made short work of the blaze

In the twelfth lap Limberg changed a left rear tire in 30 sec. Devigne changed a right front in the seventeenth in 1 min. Henderson's Maxwell went out with oil trouble in the twenty-first lap and Devigne again changed the tire, this time a right rear in the twenty-second lap. The change occupied 1 min.

Mulford's Peugeot Breaks Piston

In the 150-mile race nine laps were covered before the first car stopped at the pits. Mulford's Peugeot then came limping in with a broken piston head which ended his participation for the day. In the twelfth lap the Adams special changed a right rear tire in 1 min. and no further stops were made until the twenty-fifth when the Peusun car, a combination of Peugeot chassis and Sunbeam motor, went out with a broken rod. In the twenty-sixth lap Devigne's Delage made a tire change in 40 sec. and in the twenty-eighth the J. J. R., with Watson driving, had to stop for gasoline and oil. This was the only stop of the day in which more fuel or lubricant was taken aboard.

A steady grind ensued after the twenty-eighth lap until the fifty-sixth was reached. Here Resta in the Peugeot changed a right rear tire, the shift of wheels occupying an interval of 1 min. A broken ignition cable connecting the distributor with the No. 4 spark plug held out Rickenbacher in the Maxwell for 1 min. and 55 sec. in his fifty-eighth lap. In Resta's fifty-eighth lap the broken cylinder occurred. When he first stopped he thought only a change of plugs was necessary, but after starting, a gush of water down the exterior of the motor showed that he was out for good.

The J. J. R. special paused for 30 sec. to inspect the ignition in the sixtieth lap and seven laps later a tire change was made on the right rear and another inspection of the ignition. In the sixty-sixth lap Devigne's Delage took fire but this was extinguished without lifting the hood by the busy Pyrene squad, whose energy on this occasion boded ill for any conflagration within reach of their streams.

Limberg Killed in Metropolitan Event

THE accident during the Metropolitan Trophy race to Carl Limberg was the first that has occurred during a contest at the Sheepshead Bay track, although Harry Grant was burned and fatally injured in his car last year. Carl Limberg was born in the West but came East in 1907, when he was very active as a bicycle rider. He attained prominence in the bicycle world while riding in six-day events and was paired in Madison Square Garden in 1904 with Hardy Downing.

Carl Limberg and his mechanician, Roxie A. Pallotti, just before the start of the 150-mile race

With Downing as partner and also with Burton Downing, a brother of Hardy's, Limberg took part in many of the bicycle races. As a member of the Chalmers team he won the American road championship and his knowledge of track work as picked up in the bicycle field stood him in good stead.

Limberg was married and since his wedding has lived in this city. His last place of residence was at the Woodstock Hotel on Forty-third Street. Although quite young in appearance he was about thirty-two years old, and it was quite difficult to believe from his youthful countenance that he had been in the cycling and automobile fields for nearly a score of years.

For several years Limberg was a team mate of Harry Grant, who, as stated, was fatally burned on the same track. He drove a Haupt-Rockwell in the 1910 Vanderbilt and an Abbott in the 1911 Vanderbilt and Grand Prix races. He raced with Grant in the 1915 Indianapolis and Chicago races, and in the Astor cup race last fall he finished in sixth place. After this event he was sent to France by H. S. Harkness, by whom he was employed, and who holds the office of president of the Sheepshead Bay Speedway Corp. At this time Limberg brought back three new cars, in one of which he was killed.

Roxie A. Pallotti, Limberg's mechanician, who was also killed in the fatal accident, was a native of Italy. He received his early training in the automobile business in that country and had been employed in various automobile factories in Europe and America.

Italian Car Factories Speeding Up

Plant Extensions Are the Order of the Day—Aeroplanes Increase Car and Truck Makers' Work—All Workers Placed Under Military Discipline

TURIN, ITALY, April 2—Extensions are the rule among Italian automobile factories, and in every shop speeding up is being attempted. The factories are supplying all their own army's requirements and are shipping considerably to France. No foreign trucks or touring cars are being imported into Italy. Shipments to England appear to have fallen off, the best Italian customer now being France. In taking as many Italian trucks as possible, in preference to American, the French authorities avoid freight difficulties and the attendant high cost, and also have the advantage of a favorable monetary rate of exchange. The exchange between France and Italy is about 10 per cent in favor of the former country, while between France and America it is 20 per cent in favor of the latter country. It is claimed that practically all the trucks attached to the Verdun army have been supplied by Fiat. This army of 250,000 men is entirely dependent on automobile traction for its food, ammunition and general transportation. The position here is such that the Germans have been able to bombard all the railroad lines a considerable distance in the rear of the French, making it necessary for everything to be brought up by road. This appears to be the only case along the whole battle front of France in which complete dependence has had to be placed on automobiles. The manner in which the French have been able to hold in check the most formidable attempts of the German army to break through is proof that automobile traction has been equal to the task imposed upon it.

Aeroplanes Increase Work

Increased work has been thrown on the Italian automobile factories by the extension of the aeroplane service. After hesitating a long time between the airship and the aeroplane, and being the victims of interested partisans, the Italian authorities, like those of France and England, have decided definitely in favor of the heavier than air type. A well defined program is in course of execution, and its completion will place Italy in the front rank. In aeroplane design the Italians are receiving all their inspiration from France, every leading French army type of machine being built under license in Italy. The Italians are more independent as regards motors, and although the same general lines are being followed as in France, the design is entirely Italian. All the Italian automobile factories are actively producing aeroplane engines, and in addition the Italian Gnome and Rhone Company is producing rotaries. As in France, the Rhone motor appears to be preferred to the Gnome. This company was established in 1912 with less than a score of workpeople, and now has several hundreds and is still extending. Quite recently the Gnome people of Paris sold out the greater portion of their holdings in the Italian branch to a French group in which the Darracq automobile company predominates. The Seguin Brothers who founded the Gnome company in France, retain all their interests in the parent company, and in the Rhone concern which has been incorporated with it. There is a decided move toward motors of 200 to 300 hp., these of course all being of the fixed-cylinder water-cooled type. This same tendency is observable in other European armies.

Despite the war, experimental work is being carried out in most of the factories and new models are being prepared, although the number of cars built for private use is decidedly small. The small high-speed twelve-cylinder motor—a motor of not more than 2½ in. bore and running at 3000 r.p.m.—is receiving attention; also work is being done on small four-cylinder models, corresponding roughly to the cheaper American types but having a more elaborate finish than is usually found on cars of the less than $1,000 class.

Italy Independent of Outside Supplies

Italy appears to be fairly independent of outside supplies except of magnetos and tires, both of which are being imported from America. The result of the war has been to make the factories more independent. Fiat for instance, is now producing all electric equipment for its own cars—lighting and starting sets—and will, it is declared, build magnetos also within a very short time. As this factory is doubtless the largest in Europe, the move is of no small importance.

Italian, French and English automobile manufacturers intend to be independent of Germany for magneto supplies, and also, if possible, to be self-supplying in this matter. This independence has not yet been reached, for American magnetos are still selling freely. Recently a French commission agent received intimation from New York that 1000 magnetos could be shipped immediately. A communication was sent to the five leading French automobile factories, and in a few hours the lot of 1000 had been sold and application made for 3000 more.

Italy is very little disturbed by England's decision to forbid the importation of touring cars for private use. The volume of this business has been small, there are considerable difficulties in shipping, and the home army can absorb all that the factories can produce. France appears to be equally indifferent, for it is freely admitted that the production of private cars is not as profitable as the manufacture of shells and other war material. The net result will be that a number of Italian and French agents in London will close their showrooms.

All Under Military Discipline

All workers in Italian factories are now under military discipline. This applies not only to men who are eligible for active service in the field and who have been placed in the factories instead, but to those whose classes have not yet been called up for active service. The former are identified by a tricolor armlet, which must always be worn, and the latter have a special army badge in their buttonholes. Failure to report at work, or even late arrival, is punished immediately, and a second or third offence is liable to entail imprisonment. All strangers are kept away from the factories.

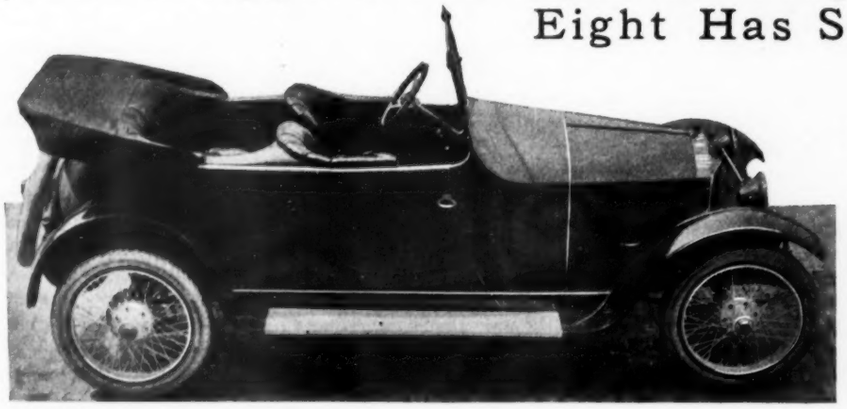
The normal working day is 10 hr., but most men do 2 hr. a day overtime, making a working day of 12 hr. All factories are running two shifts. On Sundays factories run half days. Some time ago the workers in the automobile and general engineering factories secured Saturday afternoon half holiday, as in England, but this has been abolished by order of the military authorities. One of the leading factories is endeavoring to enforce more stringent laws than are stipulated by the military authorities, and has given instructions that

work must be carried on all day Sunday and on all holidays. From the standpoint of the manufacturer this is a move of very doubtful intelligence, it having been clearly proved elsewhere that if exerted beyond a certain degree labor goes stale and production falls off.

This attempt to enforce 360 working days a year is arousing the opposition of the working classes. In the socialistic press vigorous attacks are being made on the individuals directly responsible for the new conditions. There is no reason to believe that this move will become serious, for the spirit of the people is right; nevertheless there is plenty of material for the agitators, and when protesting against the attempt to speed up they do not forget to mention that last year the Fiat company earned more than $3,000,000, after paying big fees to the directors.

Gasoline now costs three times more than before the war. Italy is, of course, shut off from European supplies and must import exclusively from America, paying high freights and insurance. The army authorities get all the gas they require for automobile and aeroplane services, but it is not always an easy matter for the private owner to get enough to keep a car in commission. There are no restrictions on the use of cars outside the army zone, and no attempts to artificially control the gasoline supply. Within the interior of Italy motorists can move about as freely as in peace times, provided they can get supplies of gas; but toward the frontiers very stringent regulations are in force. This applies not only to the Austrian frontier, where fighting is in progress, but to the French frontier and particularly to that of Switzerland. Unless a special pass has been obtained, these zones cannot be approached in an automobile, the military restrictions being rigidly enforced in every particular.

New Scripps-Booth Four-Passenger Eight Has Sociability Seating



New Scripps-Booth four-passenger eight-cylinder model, showing seating arrangements

ALTHOUGH description and details of the new Scripps-Booth four-passenger, eight-cylinder model were given in a recent issue, actual photographs of the new car are just available, and reveal the fact that the latest creation lives up to the body standard already set by the earlier Scripps-Booth design.

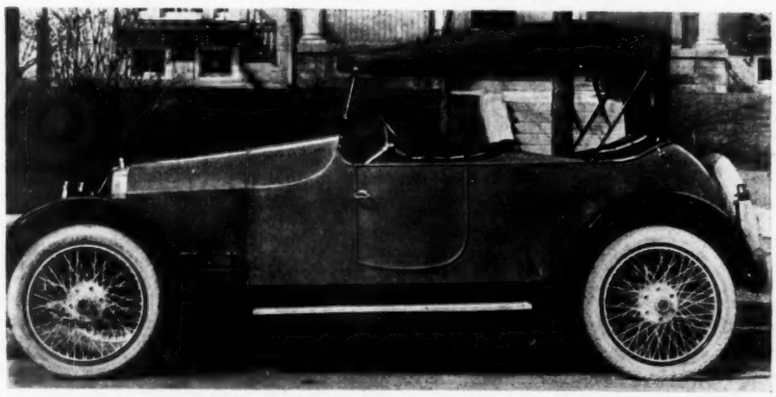
The seating arrangement is what might be termed the sociability type, in which entrance to the rear compartment is effected through a 7-in. passage between the individual front seats, there being only two doors to the body. The same general curve and sloping lines which are given the roadster are carried out in the four-passenger car, with the windshield tilted backward at a slight angle, in conformity with the curve of the cowl at this point. Back of either front seat a semi-deck idea has been carried out which adds materially to the general appearance. At the rear the body is curved outward and the spare wire wheel lends a finishing touch. The fenders are crowned and follow closely the curve of the wheels, with nothing whatever on either running board to disturb the sloping effect of the whole.

The extreme body width is 46 in., while the rear seat has a width of 34 in., with a depth of 22 in. Front seats are each 16 in. wide and 21 in. deep. There is a surprising amount of leg room in either compartment.

Some of the mechanical details of this new Scripps-Booth include the 2⅝ by 2¾ in. overhead valve, eight-cylinder motor, which develops 35 hp.; Wagner starting and lighting by a two-unit system; thermo-syphon cooling system; Zenith carbureter; Remy ignition; multiple-disk clutch; three-speed gearset; three-quarter floating rear axle; cantilever rear springs, and 34 by 4 tires. The wheelbase is 120 in.

One of the features of the motor is the provision for easy adjustment of the inclosed overhead valves in that adjustment of the clearance between the end of the valve rod and the rocker which actuates the the valve stem is afforded by the adjusting nut protruding through the top of the cover plate. By means of these facilities it is possible to adjust the valve clearance while the engine is running, if desired. First the cap which goes over the adjustment proper is removed and then a screwdriver may be used to turn the slotted head of the adjusting nut, the locking nut having to be loosened first. An experienced person can tell by the feeling of the valve rod just how much clearance there is.

The Remy distributer is vertically mounted, so as to be driven by a worm gear off the front end of the camshaft. The coil is mounted in close proximity to the distributer and both are adjacent to the generator. Centralization of the electric apparatus is the result and it tends to shorter wiring.



Side view of the four-passenger Scripps-Booth eight, showing semi-deck behind front seat. Note rounded rear carrying spare wheel

Paragraphs on Current Topics

By Marius C. Krarup

Motto: Radical Thought, Conservative Action.

Many hopes were centered once in acetylene gas as a motor fuel. Absorption in acetone finally made it safe enough for illumination purposes. But its extremely wide range of explosiveness in admixture with atmospheric air operated against its use in any other form and still restricts its employment for autogenous welding and metal-cutting. The lessons in caution were taught mainly through accidents, and it was only at a comparatively late date that the figures were ascertained which explained them. Anywhere from 2½ to 65 per cent of acetylene gas mixed with air forms an explosive mixture. That is too dangerous. In these days of gasoline substitutes—formed in part by the decomposition of water, it seems, like acetylene—it might be well to reverse the order of proceedings and start with an examination of the fluids and their vapors rather than with accidents. Should it be found that the vapors form an explosive at almost any rate of admixture with air, it would be safe to insist on a suitable modification before employing the fluid in automobile motors. On the other hand, if a fluid such as that discovered by Enricht is found to be safe and may be produced from a relatively small quantity of solids, by their action on water—stating the case roughly—what a remarkable effect in military transportation affairs we would at once be called upon to consider. An expedition such as that which went into Mexico recently could then carry sufficient fuel to warrant the extensive use of automobiles for the transportation of soldiers, ammunition and other supplies. The rapidity of a raid could be trebled and therewith the chances for success. The anomaly of forced and exhausting marches for men and horses in this age of motor vehicles could then be avoided, and much of the laborious organization of the rear guard which is now necessary could be dispensed with.

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The Preparedness parade in New York now being over and a receptive mood engendered, engineers ask with their usual professional frankness for complete specifications. We want an efficient Preparedness, if not necessarily the cheapest; plain preparedness, with a small p, in defense of PROSPERITY, in caps.

□□□□□

What is the difference between new construction and invention? The question has been asked and the S. A. E. committee on nomenclature has not yet supplied the answer. "Construct more, invent less" (*Mehr construieren, weniger erfinden*), was Guldner's advice to engineers, meaning about the same as the Roman: *Natura non saltat*, applied to industrial progress, or "Avoid leaps in the development." But there is a financial side also, and American investors will have none of construction, as a rule, while invention often appeals to their fancy, even though it usually has to be reconstructed afterward. Can it be that you "construct" for your own business and "invent" for somebody-else's? That no other distinction is possible?

□□□□□

Though a taste for hard work is now considered a virtue of the first order only in unskilled men and horses, it is noticed that a large majority of the air pumps used for compressing air, either in tanks or in tires, are of the hard working variety and are lacking in efficiency by reason of high piston friction and slow operation. If worked by hand they usually involve a large reciprocating movement of a human body. Probably the net efficiency does not exceed 5 per cent, and the rest is mortification of the flesh. Rotary motion by foot pressure is almost as uncommon as the employment of a liquid (glycerine) piston working perfectly without tight packings. There must be room for better average methods and a more widespread appreciation of what they should be. On another page an air pump construction is illustrated which may suggest ideas on this subject, although it is not directly applicable to any other automobile uses than that of keeping air tanks in garages supplied with pressure.

□□□□□

A New York daily insists repeatedly, and with some editorial chagrin, on the rule that pedestrians should cross at the crossings under the supervision of the traffic squad officer, as recommended by the Safety First Federation of America, and believes that strict enforcement of this regulation would reduce the number of accidents. That one person should be able and constantly willing to do better for thousands than each is able to do for himself, remains, however, a theory anything but plausible to those who have confidence in their own faculties, and many find it safer and far more comfortable to pick their own way, preferably at the middle of a block, where the periodic stoppage of the traffic at the intersections leaves a perfectly free passage at almost regular intervals. The rule is a good one to follow for the majority and to break for the few. It works best when not enforced.

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Had a case ever come to notice in which a driver of a car operated one set of brakes to avert an accident and, after finding it out of order, operated the second set in time to accomplish his purpose, the belief that two sets of brakes are worth less than one might be hard to defend. As everybody knows, however, the emergency brakes are used in practice only to hold a car at a standstill on an incline, and the service brakes could easily be connected with a notched quadrant or bar for that purpose, still leaving the ordinary operation as free as it is now. This being the situation, it is obviously suggested that the equipment of cars with two sets probably is little more or better than a needless survival from the days in 1897 and 1898, when officials all over were nervous about the control of automobiles and imposed restrictions upon design and construction somewhat as their inexperienced fancy dictated. Brakes, particularly, became an official hobby for legislators, not here only, but in even higher degree in France. An imperative precedent was created. But at this more advanced stage it should be possible to reason on the subject. And it is well understood that one perfectly reliable set of brakes will do all the retarding required; that it is more easily and safely kept in good order than two; and that the use of two on the rear wheels interferes with the best construction and dimensions for each of them, the contracting band brake, for example, hindering the cooling of the expansion brake. It is also understood that, if one of the two sets were abandoned, there would be a better chance for getting perfected the sort of brake which could be used constantly on long declivities without overheating, or perhaps for getting adopted a system acting on both front and rear wheels in the most approved manner. At all events, the question of two sets or one should probably be a current topic, even though in

reality it has not yet impressed either the industry or the public very seriously.

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In Major Lawton's list of requirements for army trucks one of the most impressive is to the effect that all vehicles to be operated together should be of the same make, in order to have the repair department efficient. Among the lessons he draws from the present war he places in the first line that "ordinary commercial trucks are best; the special body types not necessary." But among the problems to be solved by American truck manufacturers, he mentions as the fourth: "Determination of the best body for use." A lightly built two-ton stake truck with large platform and storage for tarpaulins and rope in the platform was found the most useful type of all, according to another source of information, being especially valuable for the rapid shifting of troops over poor roads. It holds more men than any other type, and they can get on and off most quickly.

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The buying public is the final judge of construction it is commonly said, even among engineers. The public's verdict is not based on technical argument, but on practical performance, they add. Against the trend of these statements let a few other ones be registered. For example: The public's verdict varies from day to day as well as geographically. Good technical argument gives full consideration to practical performance. Every smart salesman influences the public verdict. Every captivating advertisement does likewise. And does the public buy practical performance in anything else, aside from automobiles—in literature, stage productions, food, drinks, homes—or does it buy something which appears at the moment sentimentally satisfying? If there is a schism between technical conclusions and practical results, there remains the explanation that the technical argument is not quite strong enough or is not sufficiently fortified with human shrewdness.

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WAR CORRESPONDENCE:—M. Klayn, Berlin—*Konstruktionsberechnungen* etc., by A. G. von Loewe, which you posted us in December, according to your letter of advisement which reached us in February, has not yet arrived. The censors at Falmouth or Kirkwall may suspect a code in the formulas and equations, or the information contained in the book may be too valuable to be passed along. Hoping that they will soon get through studying it, we remain——

Failing to reach the German publisher by letter, we are trying this method, as THE AUTOMOBILE still reaches Germany, at least occasionally, this being evident from the articles which are found translated in German automobile publications, some of the latter continuing to arrive, though at very irregular intervals. Von Loewe's book deals largely with formulas for design and methods of manufacture, and is said to be very interesting.

Rotary Valveless Air Pump Suitable for Garages

AMONG new constructions of British design there appeared last year in the market a rotary and valveless air pump well suited to be driven from a small electric motor, as the resistance to its operation is never concentrated at any one point and high pressures must be produced through high speed of the machine. It is made by Globe Pneumatic Engineering Company of London, but during war conditions is probably mainly of interest to Americans as a subject for study. The illustrations and description given herewith are taken from *Engineering* of July 23, 1915.

A photograph of the rotor is reproduced in Fig. 1, while Fig. 2 shows a longitudinal section of the pump together with a centrifugal device at its left for separating water from the air, and Fig. 3 shows an end view and cross-section. The essential parts of the pump are the rotor, Fig. 1, which is shown at *A* in Figs. 2 and 3, and the drum shown at *B* in Figs. 2 and 3. The casing *C* protects the pump from dirt and shields the rotating drum but takes no part in the action.

The rotor is built up of a cast central spider carrying an outer ring which has a deep double screwthread on its circumference. This thread is right-handed over half the width of the rotor surface and left-handed over the other half. Crosswise of these very deep threads there run partitions of half the depth, as shown in Fig. 2, and fairly close together all around, as can be seen in Fig. 1. The rotor is coupled rigidly to a shaft which is made in two parts with facing couplings bolted together through the center of the rotor. The part of the shaft to the left is hollow and the bore forms part of the suction pipe.

The pump is here described as a vacuum pump, but by reversing the operation it becomes a compressor and the hollow portion of the shaft becomes the discharge pipe for the compressed air. When used for high compression the speed of the pump must be proportionately higher than for exhaust work.

The rotor is carried on SKF ball bearings which are mounted on bosses forming parts of the frame *C*. Drum *B* is practically a plain cylinder with closed ends and is also mounted on ball bearings mounted on the same bosses that carry those for the rotor. But the relations of the drum to the rotor and of the two sets of bearings are eccentric, the drum being lower.

When the pump is to be operated, water is run into the drum through pipe *D*, Fig. 2, until it stands at the level of the bottom of the hole in the guard-ring *E*. If more water were run in, it would run out into the bottom of the casing *C*. The rotor is then driven around by an electric motor or any other convenient and suitable means. In rotating, the rotor tends to carry the water with it, partly owing to surface friction and partly to the trapping of the water by the cross-partitions between the helical circumferential grooves. The drum, being quite free to rotate on its bearings, is carried along with the rotor by the skin friction of the water, and 15 to 30 sec. after the movement is started the rotor and the drum therefore rotate together, and the water which is carried around between them distributes itself by centrifugal force at a uniform depth all around the inside of the drum.

Pumping now takes place owing to the action of the screw-thread grooves on the rotor and the eccentric position of the drum. The water being evenly distributed, any part of the partitioned circumference of the rotor

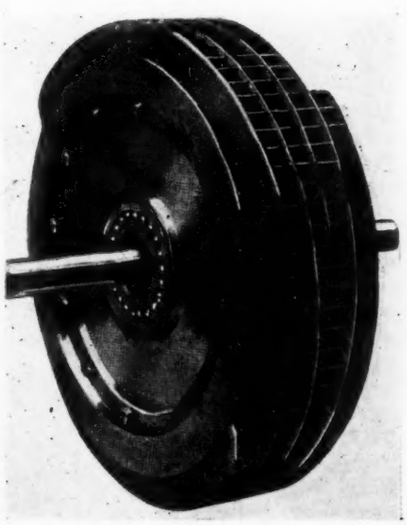


Fig. 1—Rotor of Globe-Johnston rotary valveless air pump

continually dips deeper into the cylinder of water surrounding it as that part approaches the top position, and it lifts partly out of the water as it approaches the bottom. This tide of water between the threads causes the pumping, as follows. Air passes from the hollow shaft through a space in the center of the rotor spider to the circumference of the rotor between the right-handed and left-handed threads. At the bottom of the rotor the tide is low, and, as a consequence, communication is established around the end of the inner thread—when this is at the bottom—between the suction channel and the unfilled space between the threads. As the rotor moves further around, however, it dips more deeply into the water and consequently the connection of the air spaces is very shortly severed, the rising water in the groove interrupting it. A bulk of air is thus isolated in the passage, and, as the rotor continues to move around, this air is driven forward through the passage between the threads, because the passage continually decreases in cubic capacity through the rise of the tide in it. The trapped air is thus driven along between two threads and is discharged when it reaches the end. It begins to leave the rotor at the point where the outer edge of the ring *F* leaves the water. At this point communication is established from the passage between the threads to the inside of the drum, and from there the air escapes into the casing through the holes *G* shown in Fig. 2. The discharge action can be clearly understood from the photographic view of the rotor, Fig. 1. The ring *F* is there well shown. Toward the top of the rotor this ring dips into the water, so that there is no connection from the passage between the threads to the inside of the drum. Toward the bottom of the rotor, however, where this ring leaves the water, the air escapes around the end of the last thread and passes to exhaust. As the rotor is double-threaded there are two discharges per revolution. The use of right and left-handed threads eliminates end thrust. Air enters at the center of the rotor, passes in both axial directions and is discharged at both sides.

It will be clear that in this interesting mechanical arrangement the rotation of the drum and of the water have nothing directly to do with the pumping action. The pump would work equally well if the water were standing still around it, provided such a thing were possible, but the rotation of the drum is of course necessary to maintain the water ring. It also has the advantage of eliminating friction, neither the rotor nor the drum having any motion relative to the water in the direction of rotation, and the drum no motion radially, either. Only some slip of the drum may occur, owing to the slight resistance in its ball bearings and external air friction within the casing.

The pump has no rubbing parts, except the bearings, and there is apparently nothing which is liable either to wear or to get out of order. No water is consumed except what is carried off by evaporation with the pumped air. The water is merely a seal. The drum may be filled to the correct height and left alone for a long time. But, if the level of the water falls seriously below this height, the capacity of the pump will decrease, and to avoid this a continuous water circulation may be arranged for.

When the pump is used as a compressor the water ring has to maintain the pressure of the receiver tank. If it could not do this, the water would be forced out of the drum over the guard-ring *E* and into the casing. It must maintain this back pressure by its centrifugal force, and consequently the higher the pressure the greater must be the speed of revolution.

[A loose estimate would indicate that for the purpose of compressing air in a garage tank a speed of 6000 to 8000 revolutions per minute might be required.—M. C. K.]

Adaptation to Fire-Engine Pumps

As the wide adoption of motorized fire-fighting apparatus for American municipalities bids fair to be continued and greatly extended, many designers are undoubtedly working on improvements for the type of fire engine in which the use of centrifugal pumps is the main characteristic. Were it not for the necessity—existing in those locations where the water supply is not under pressure—of priming these pumps with water in order to start the stream, they would oust the more cumbersome reciprocating pumps, and the apparatus on the whole would be cheapened and improved. In this connection, too, the Globe-Johnston air pump seems to suggest ideas which might be turned to excellent account in capable hands.

The subject is too large and specific to be dealt with in detail in this place, but to make the suggestion which the Globe-Johnston pump mechanism conveys a little clearer, it may be mentioned that the small water supply—sometimes 100 gallons—which is usually carried for starting the centrifugal pump occasionally fails to accomplish the starting, due to leaks in the suction hose or hasty coupling, and then delay is caused which may prove costly. A simple and positive rotary suction pump would overcome this defect and permit dispensing with the auxiliary water tank.—M. C. K.

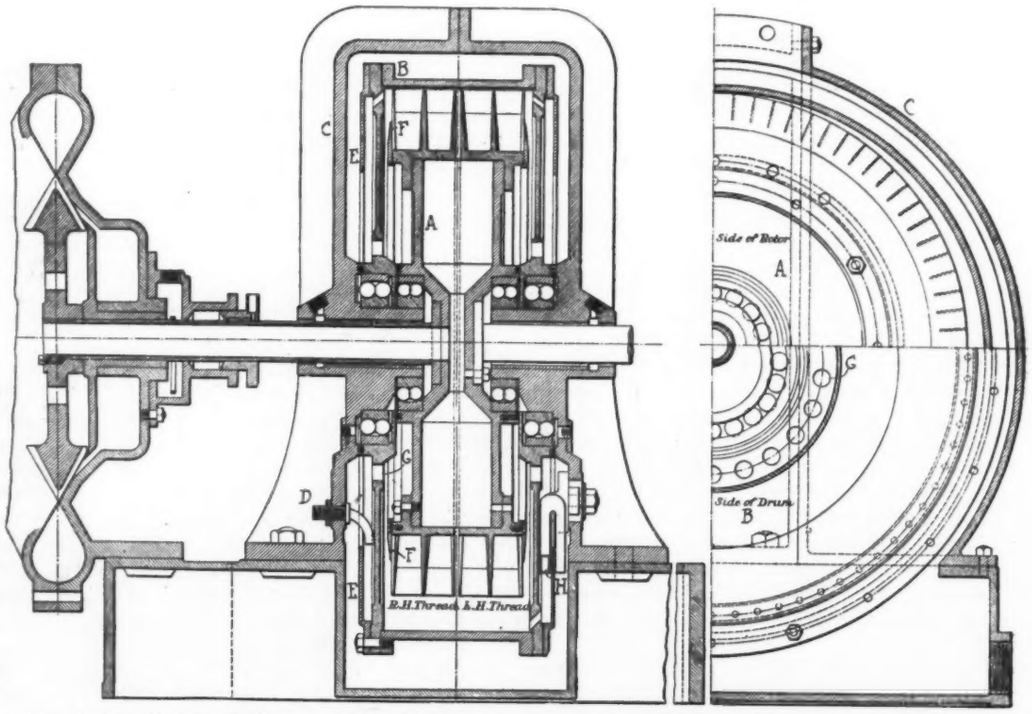
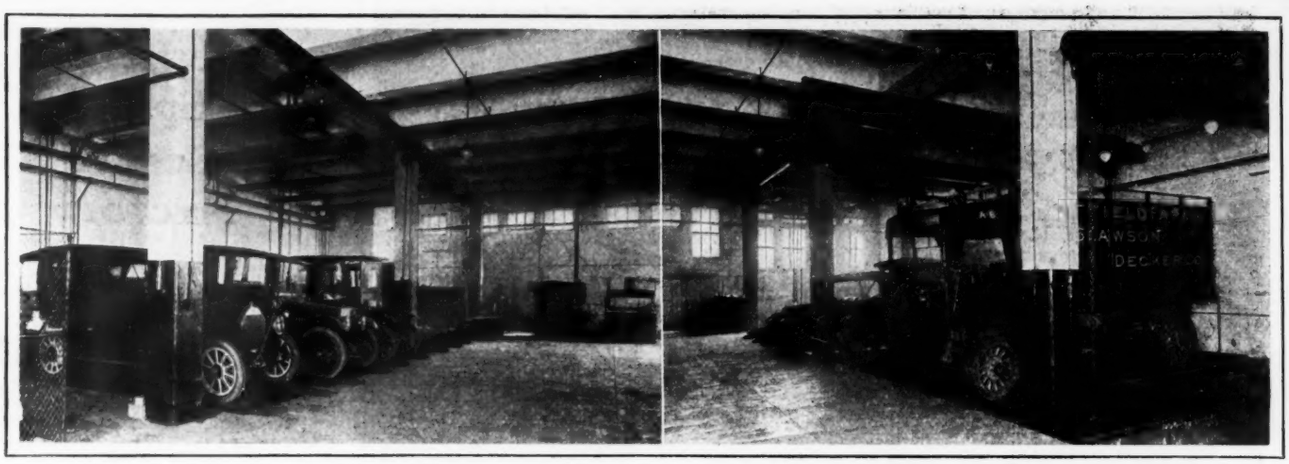


Fig. 2—Longitudinal section of Globe-Johnston air pump and compressor, with air drier and cleaner at extreme left. Fig. 3—End elevation and cross-section



Panorama showing the interior of the first floor of the Perfection service building with passenger cars and trucks on the bays

Perfection Spring Erects Service Building

Self-Supporting Plant in New York Manufactures Its Own Stock in Accordance with Home Factory Standards

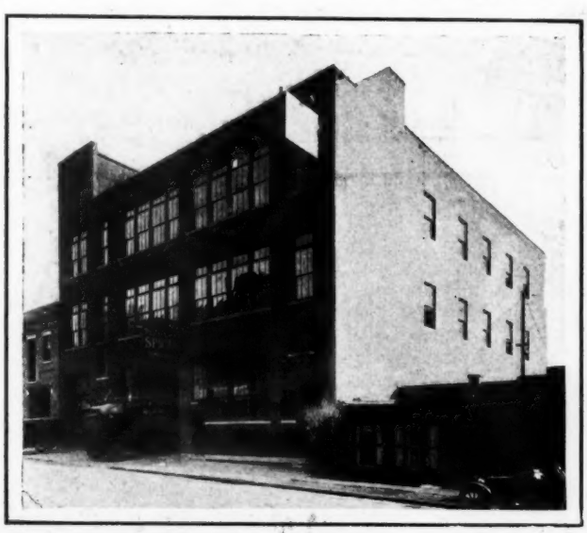
A NEW standard in service for automobile spring users has been set by the Perfection Spring Co. in opening what may be called the first complete spring service plant in New York City. Housed in a three-story building which will eventually be increased to five, designed especially to meet the requirements of an ideal spring service station, the new plant of the Perfection company is of particular interest.

The service work is designed to not only take care of individual owners but also to lend a helping hand as far as springs are concerned to the automobile repair and service shops in the vicinity. There is nothing in the way of automobile springs which cannot be handled quickly and efficiently in this shop because it is not only supplied with a large amount of stock springs for standard models but is also in a position to manufacture springs for obsolete models or for special cars.

An interesting feature of the plant is that it is entirely self-supporting. It is equipped with its own heat-treating plant, pyrometer, testing machinery, etc., and in the hands of men who are familiar with the methods and standards of workmanship of the home plant in Cleveland. Hence, the work done in the main factory can be duplicated in this combination service and manufacturing plant. Primarily, however, the building has been laid out for service with manufacturing as a secondary consideration, although nothing has been neglected to make equipment for the latter complete.

There is no truck too large nor roadster too small to be taken care of in the shops; and, owing to the fact that the building has been laid out particularly for spring work there are a number of facilities which permit the workmen to operate at a great advantage and hence reduce to a minimum the length of time spent on any job. Perhaps the most noteworthy feature in this respect is the use of bays in which the cars are run over a long deep pit on tracks formed of built-up H-beams. There are twelve of these bays, nine being designed for touring cars of any size and three for trucks of any capacity. The width of the track of some of these bays is adjustable and cars other than of standard tread can be handled just as readily as those with the 56-in. span.

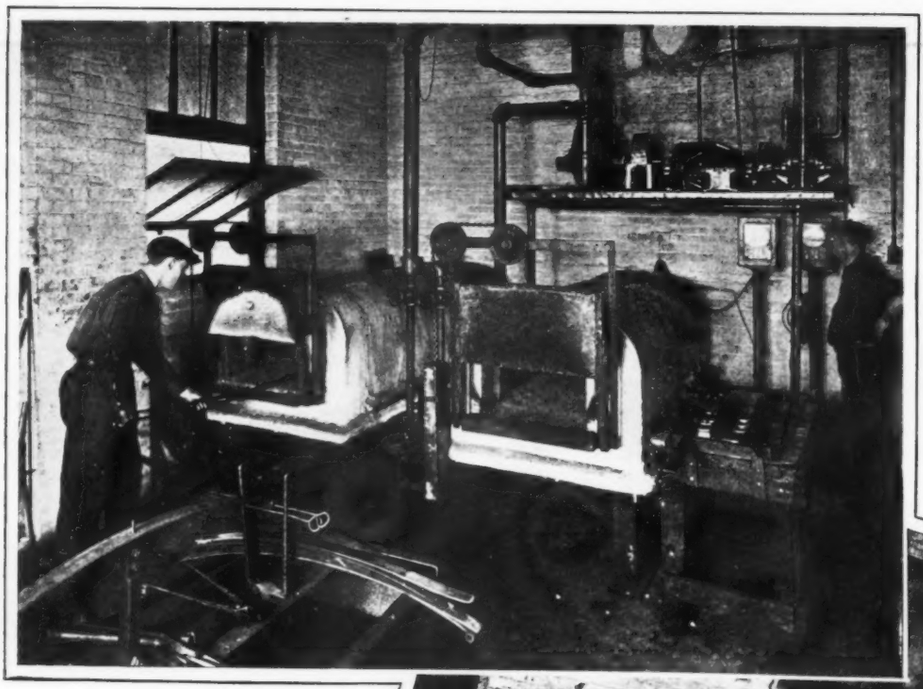
The area of each floor is 75 by 100 ft. with a wide aisle down the center of the first floor and the bays arranged six on a side. As a car enters the door, which is in the center of the first floor, it is stopped opposite the office and the necessary job tickets, etc., arranged. The car is immediately swung around on a combination truck and jack and pushed on to the H-beam tracks over the pits. The men are then free to work on it and if the car has been built any year after 1909 the stock spring will probably be found in the stock storage room of the plant. In case of an odd spring or an odd leaf it can be made in quick time in the shop.



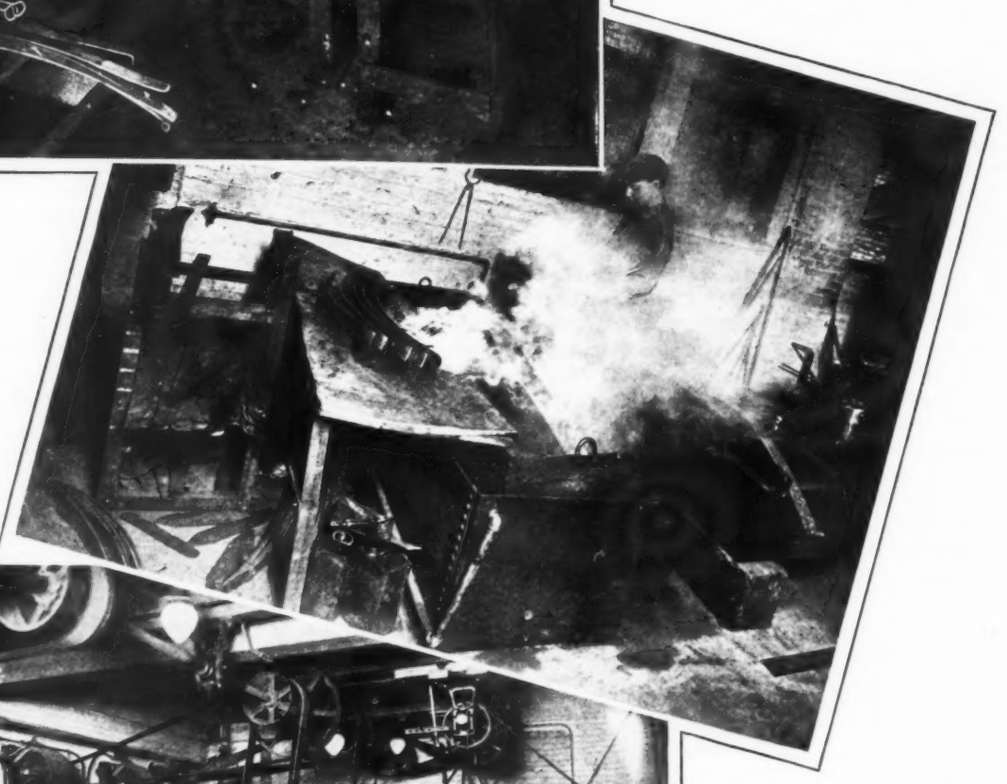
The three-story building which will eventually be made a five-story structure

With the cars on the bay the workman has the spring at about shoulder height and is therefore able to accomplish the work in much handier style than if he were compelled to labor in a stooping position or lying on his back. This arrangement for the convenience of the workmen has its reflection in the time on a given job and also permits of much greater care in setting up bolts on spring clips and other

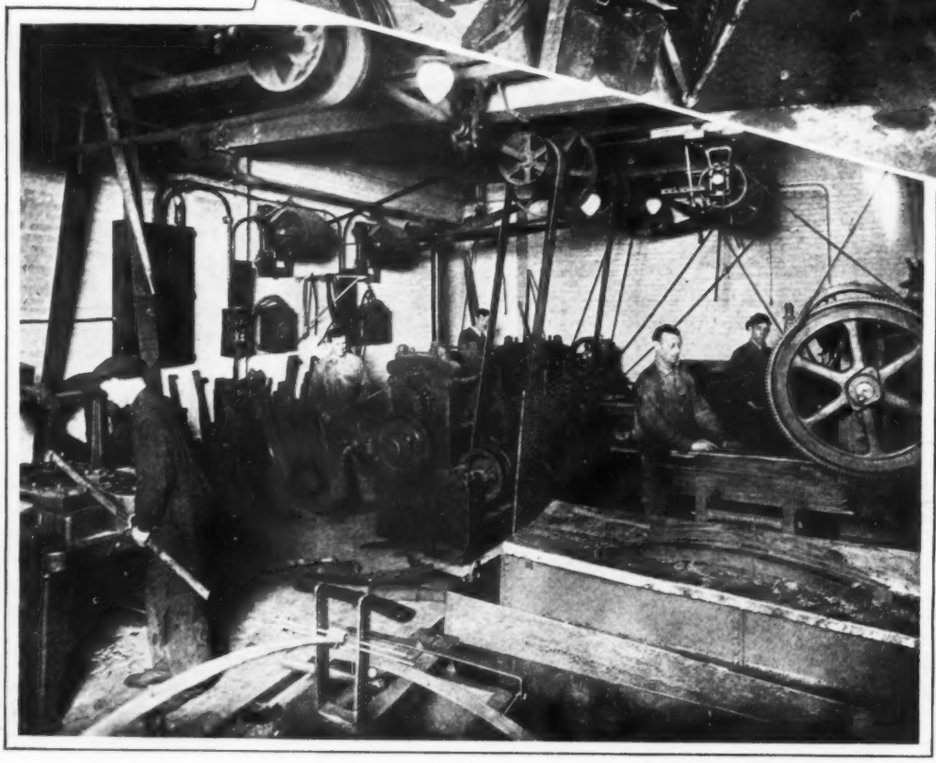
Perfection Spring Service Factory



Top, left—Heat treating furnaces and pyrometers used in the Perfection Co.'s New York plant. These furnaces are equipped and arranged to give the same heat treatments as are afforded the springs in the home plant of the company



Center—Heat treating baths employed in tempering the spring leaves made in the New York plant. An economical arrangement is secured by having the workmen between the furnaces and the heat-treating baths



Bottom—Machine shop for turning out the finished springs. Note the individual motor drive to each machine. This machine shop is located in the same room with the heat-treating plants and the dipping baths, giving a full spring factory in one room, so that all kinds of spring work can be done

parts which are very often located so inaccessibly that it is difficult to properly adjust them.

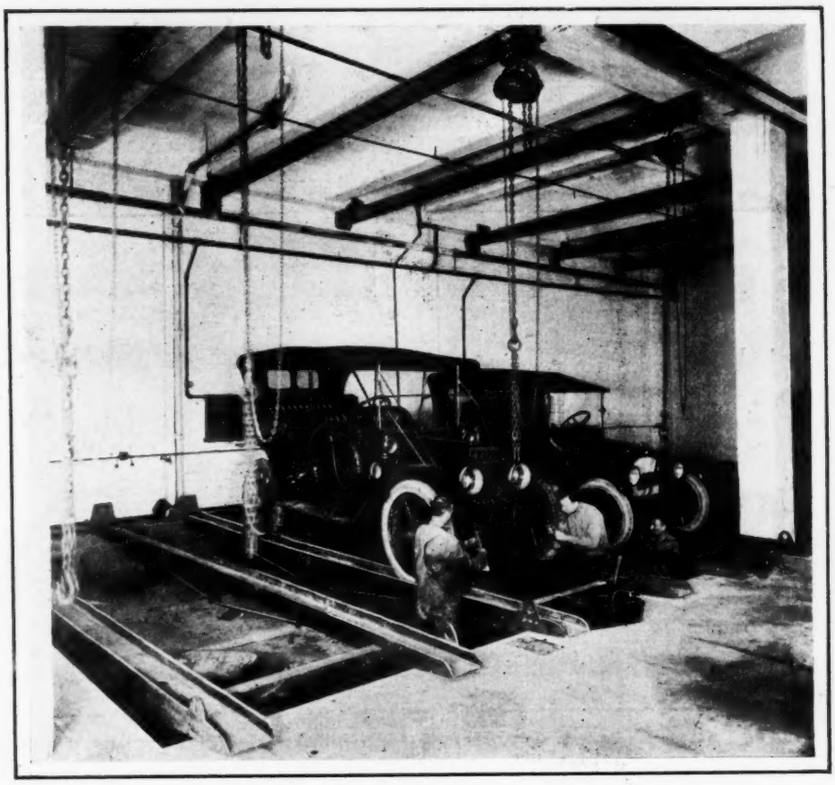
Chain Hoists Used

Above each of the bays supported by overhead I-beams are chain hoists. These are capable of lifting any of the cars which enter the shop and are graduated according to the size of the bay. The smallest bays have H-beam tracks which are 9¼ in. wide. The track beams for the large trucks are 30 in. in width and the overhead hoisting apparatus is graduated in much the same way. The tread distance from center to center on the touring car tracks is 56 in. and for the trucks it is 70 in. normally, although adjustments can be made, as stated, for variation of the tread.

Shop Is 50 by 22

In order to take care of the trucks fitted with very high bodies the ceiling height of the first floor is 16 ft. and as the maximum truck height is close to 14 ft., this leaves 2 ft. for exceptional circumstances. The elevator is also of large size, the dimensions being 12½ by 27 ft. On the second floor the supports have been arranged especially to take care of the heavy loads of spring stock. The capacity of the floor is 250 lb. per square foot. The idea of placing stock on the second floor is that eventually when municipal improvements have been made this will be on a level with the elevated freight lines which have been planned for, making shipping and receiving stock very easy matters.

One of the interesting parts of the layout is the shop. This is on the first floor behind the main room containing the bays. It occupies a space 50 ft. across and 22 ft. deep. At one end are two heat-treating furnaces and pyrometers fully equipped to provide the same delicacy of control as is used in the home plant of the Perfection company in Cleveland. The workmen are familiar with the heats used in the Cleveland plant so that a finished spring produced in New York has the same materials and the same heat treatment as it would have had it come from the home plant. Behind the heat-treating furnaces are the dipping baths so that a workman operates between the furnace and the bath, being free to take the materials from the furnace and immerse them immediately in the heat-treating oils. The machine necessary for shearing the spring material, grinding the leaves, wrapping the eyes and doing other necessary machine work in the process of manufacture are all operated by individual motors supplied by current taken from the public service lines. The fuel used in the furnaces is gas which is also piped into the building from the outside lines.



Passenger cars mounted on the bays awaiting the attention of the Perfection service men

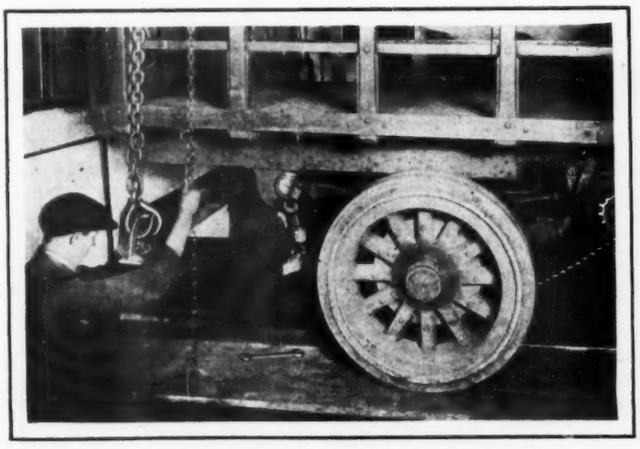
For spring testing there is a Tinius Olsen machine which is capable of handling the heaviest springs. Outside of the individual inspection given to each spring blade the entire spring can be inspected and tested on this machine.

Manufacture Springs

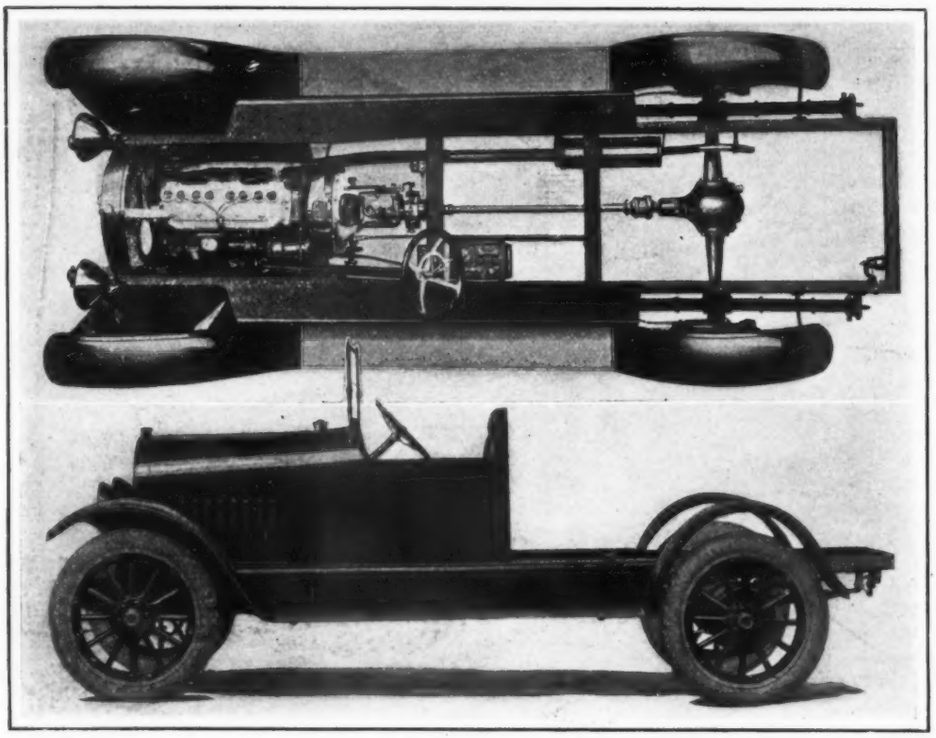
The manufacture of springs in this plant is a part of its economical operation. The men when not engaged in repair work are utilized as manufacturing hands and thus any springs which are running low in the stock room can be manufactured and stored against future demands. This gives an arrangement whereby there is no idleness of the hands while waiting for repair jobs to arrive and the owner or service station which comes in with a repair job does not have to pay for the unoccupied time of men. The New York plant is equipped with a full set of drawings of the springs used on different cars and is capable of making springs to the specifications shown in these drawings.

Educating Car Service Stations

With a plant of this kind it is the aim of the Perfection company to educate the service stations for different makes of cars to utilize its conveniences in their spring service work. It is thought that with the manufacturing and service ability of a large plant the necessity for the individual service station to maintain a large stock of springs is removed. Furthermore, instead of compelling the individual owner to purchase an entire new spring when he has broken but one leaf it will be possible to replace this leaf at a very low cost. In order to take care of the wants of the local car service stations a call-for-and-deliver service is being organized which will still further simplify spring matters for the local service station.



Bay arrangement permits men to work on the springs at eye level, thus improving speed and quality of work



The new Jeffery Rapid-Service Wagon chassis. As illustrated in the side view it sells for $900

Two New Jeffery Trucks

Rapid-Service Wagon Is 1500-Lb. Type and the All-Purpose Truck a 3000-Lb.

TWO new truck chassis of smaller capacity than the Quads have been added to the commercial vehicle program of the Thos. B. Jeffery Co., Kenosha, Wis. Though these retain to a degree the quality of sturdiness that has characterized the four-wheel-drive type, the new designs are more conventional in their transmission layout. That is, they take the drive through the rear wheels only and steer on the forward wheels only, the combination of four-wheel-drive and four-wheel-steer not being considered necessary for the lighter vehicle.

The Rapid-Service Wagon

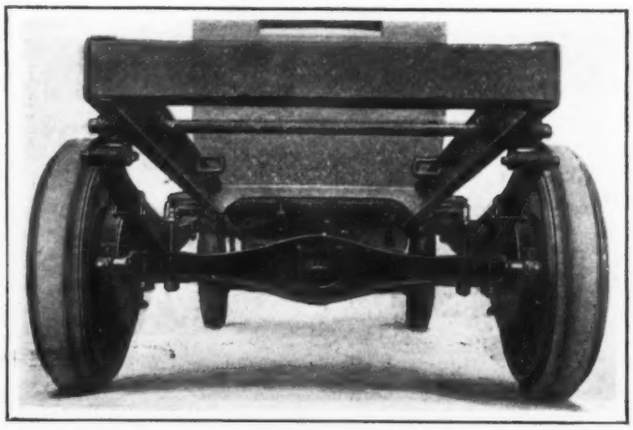
The lighter of the two new designs is known as the Jeffery Rapid-Service Wagon, and has a maximum capacity of 1500 lb. In general design it follows quite closely the four-cylinder passenger vehicle except for certain changes which are adapted to commercial practice. The chassis, which includes driver's seat, foredoors, hood and windshield, and Bijur two-unit starting and lighting, is sold for $900. A wide option of body styles is offered.

The heavier of the new models is called the Jeffery All-Purpose truck, and has a capacity of 3000 lb. This design is similar to that of the lighter one except for heavier and stouter construction. However, the final drive, instead of being of the spiral-bevel type employed in the Rapid-Service Wagon, is an internal gear system, and equipped with the M. & S. locking differential, Duplex speed governor and other features designed to adapt it particularly to its greater carrying capacity. The chassis alone, equipped with the Duplex governor in addition to the equipment mentioned for the lighter vehicle, is sold at $1,400. There is a wide choice of bodies, the flareboard express type adding only $75 to the original list price of the vehicle.

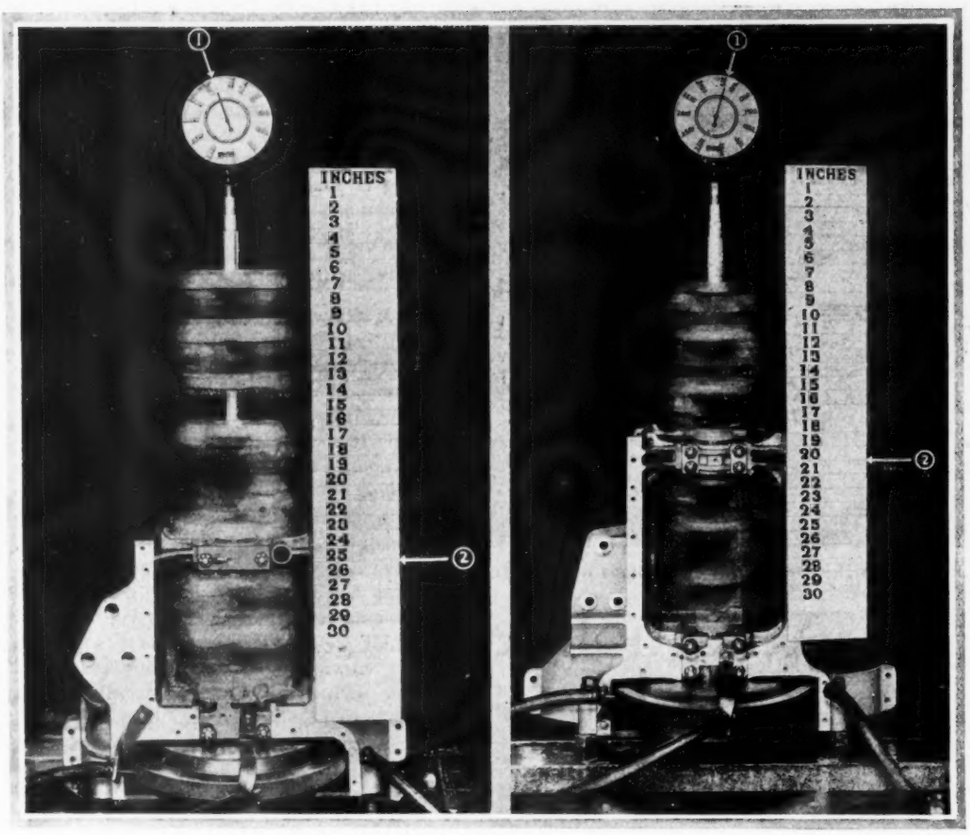
The Rapid-Service Wagon can best be described by noting the points in which it differs from the four-cylinder Jeffery passenger chassis. These differences are in the frame, the springs, and the strengthening of the rear axle, the three points at which the more rigorous demands of commercial vehicle operation necessitated a departure from passenger car Jeffery practice. The frame has been made very much heavier, the springs are semi-elliptic at the rear instead of three-quarter elliptic, and the rear axle housing is strengthened by a truss.

The detailed specifications include the four-cylinder block 3¾ by 5¼ motor, which is already familiar, Raybestos-faced dry plate clutch, roller bearings, three-speed gearset, shaft and spiral bevel with double Universal joint to a semi-floating axle, equipped with adjustable taper roller bearings. Tires are 35 by 4½ in. and the gear-ratio is 4½ to 1 on high.

The All-Purpose truck, which is the 1½-ton model, employs the same power plant as the lighter vehicle, except that the gearset is considerably heavier and stronger. The transmission of power to the rear axle is through a tubular propeller shaft instead of a solid one and the axle itself is the Celfor internal gear drive in which the weight of the load is carried on a dead axle, while the power transmission is through shafts and spur pinion to internal gears on the rear wheels. The axle shafts and the housing of the live axle are free from any suspended load. The frame and springs are very much heavier in this model than in the other, as in addition to the greater load capacity, the wheelbase is increased to 130 in. This makes it possible to give a body length of 110 in., as against the maximum body length of 80 in. in the Rapid-Service type. The rear wheels of the All-Purpose chassis are 34 by 5 with solid tires and 34 by 4½ pneumatics are used in front.



The Jeffery All-Purpose truck uses internal gear drive



Left—Hudson super-six shaft running true at 3500 r.p.m. Not bolted down and supported one-third of its length

Right—Conventional crankshaft revolving at 800 r.p.m. Upper bearings is vibrating so badly as to be indistinct. Shaft rigidly bolted down and supported half its length

Proving Crankshaft Rigidity

An Ingenious Rig Employed to Compare the Old and New Hudson Cranks

SOME interesting experiments recently conducted by the Hudson Motor Car Co. have been brought to our attention by E. V. Rippingille, assistant sales manager. These deal with the rigidity of the Hudson crankshaft resulting from the system of balancing employed.

Ingenious Methods Used

The accompanying illustrations show the ingenious method used for carrying on these experiments. The shaft was supported vertically so as to eliminate the possibility of bending due to overhang, as would be the case if it were supported in any but a vertical plane. Then, in order to eliminate any chance of torsional strain due to an auxiliary driving mechanism, the flywheel, with its face provided with teeth ordinarily used in connection with the starting motor, was converted into a turbine, several air nozzles being arranged to revolve it without actual mechanical connection. The weight of the shaft was taken on a hardened steel ball let into the end of the crankshaft.

Up to 3500 R.P.M.

The shaft was run up to 3500 r.p.m. with perfect safety and could have been run higher had the air pressure been enough to carry it at greater speed. There was practically no vibration, as the illustration shows, although the shaft is unsupported for 66 per cent of its length, as indicated by the scale which is mounted at the side.

In the case of the standard type of crankshaft, which was a unit taken from a standard Hudson 6-40 model, it was supported for 50 per cent of its length as shown. Although driven in the same manner as the super-six shaft, it was not deemed advisable to run it above 1100 r.p.m., the experimenters not daring to stay in its immediate vicinity above that speed, due to the vibration which manifested itself and which can be noticed fairly clearly in the photograph, which was taken at a rotative speed of 800 r.p.m. The case was subjected to considerable strain at 1100 r.p.m., and the upper bearing was vibrating so badly as to render it indistinct. At 800 r.p.m. this shaft swung about 1/16 in. off center.

Balancing Crankshafts

In connection with the balancing of crankshafts, Mr. Rippingille calls attention to the fact that the engineering fraternity has always talked about perfectly balanced shafts and symmetrical design, but no one ever subjected these shafts to a test on a balancing machine with the connecting-rod big ends bolted in place. The connecting-rod big end is a considerable mass of metal, and it is strictly a rotated mass that is a part of the crankshaft, for it must be taken into consideration when calculating the forces and momentum at any point.

Tests of this sort are valuable because they serve to show up a fact which is very little appreciated, namely the inherent possibilities of a crankshaft for vibration. Everyone knows that a reciprocating mass like a piston causes vibration and that the good belance of a six is due to the pistons acting against each other through the medium of the crankshaft. Properly to enable the piston forces to cancel out, however, the shaft itself must be perfectly stiff and true-running, otherwise the vibrations in the shaft will react upon the pistons and the resulting vibration will be far more violent in character than that due to the crankshaft alone.

Avoiding Vibration

In aviation engines even more than in automobile motors the avoidance of vibration is highly important, and the coming of the twelve cylinder for aeroplane work has drawn the attention of engineers all the world over to the troublesome problem of balancing a six-throw crankshaft. Any vibration in an aeroplane motor acts destructively upon the light framework or, putting it the other way about, absence of vibration allows weight in the framework to be saved. Thus it is probable that aviation engine crankshafts will undergo further development before settling down to a standard form and the Hudson type should have much to recommend it.

Convoy of White trucks passing through the shell-torn ruins of a village near Verdun

Joffre Praises Automobiles

Thanks Corps for Efficient Service in Verdun Battle When Railroads Failed

PARIS, April 15—The following communication of General Joffre to the officers and men of the Automobile Transport Corps of the Verdun army, testifies to the value of the work accomplished by this corps in the fighting around Verdun:

"Since the renewal of active operations in the Verdun district the automobile service has furnished a considerable effort in order to assure the transportation of troops and the carriage of ammunition and food. Thanks to the fine organization of the convoys on the one hand and the high sense of duty of the men on the other hand, this transportation has been carried out with the greatest regularity and in a remarkably orderly manner. The General in Chief expresses his highest satisfaction to the officers and men of the automobile service having taken part in these operations.

(Signed) "J. JOFFRE."

East of Verdun the German lines project into France in the form of a huge V, the point of the V being close to St. Mihiel, about 25 miles back of the Verdun fortress. With such a position the German long-range artillery could bombard not only the country parallel to the main French front, but a considerable portion at right-angles to it. From their point near St. Mihiel they could drop shells on the main railroad line from Paris to Nancy, in the neighborhood of Commercy, and in consequence for over a year have obliged the French to make a detour to the south over a single track winding line, where quick service is impossible.

No Railroad Service

These conditions doubtless weighed considerably with the military authorities when the attack on Verdun was decided. The preliminary was a systematic bombardment of all the railroad lines within range of German guns, leaving a French army of not less than 250,000 men entirely dependent on automobiles for movement, food and ammunition. This is the first time in the history of the war that a great army, while fighting desperately, has been deprived entirely of railroad service. In all other cases, and at all other points of the front at the present time, the railroad and the automobile work in conjunction, with a final distribution when necessary by hand or by light horse teams. It is valuable testimony to the efficient organization of the automobile service that it has been able, under the most difficult conditions, to keep the army reinforced and to supply it regularly with food and ammunition, thus making it possible for the troops to arrest the most powerful and determined attacks since the war began.

Alive with Motor Convoys

Members of the automobile corps returned from Verdun describe that district as being alive with motor convoys of every possible kind. Every type of automobile vehicle from powerful four-wheel drive and caterpillar tractors to motor bicycles is to be found on duty in this district. American trucks are very plentiful in the Verdun sector, Whites predominating, with also a large number of Packards. Fiat has supplied a large number and various French makes are represented.

All the rapid movements of troops are carried out by automobile, and it was owing to the rapidity with which the transportation-of-troops sections got to work in bringing up fresh men that the initial success of the Germans was arrested. Although all army trucks are fitted for the transportation of men in case of emergency, there is a special organization known as the T. P.—transport personnel—designed for this work. The vehicles used are either the original Paris buses or the same type of chassis with a special single-deck body. After taking the 1100 buses in service in Paris when war broke out, the De Dion Bouton and Schneider companies were ordered to continue making this type for the army, and all those which could be assembled by the bus company were immediately requisitioned.

Big Body Area of Buses

The great advantage of this type for troop transportation is the big body area in relation to the total area of the vehicle. The driver is over the motor, this being the only type in the army where the motor is not under a hood, and the frame members have lateral and rear extensions to allow of a body flush with the hub caps, and to give a big rear platform. Some of these vehicles have been in service since August, 1914, and are thus approaching the end of their second year of actual warfare. The later ones have the same chassis details but lighter and cheaper bodies. The substantial double roof with ventilating windows, also side and front glass windows, have been abolished; from the plain roof canvas sides with mica windows can be rolled down to attach to the side panels.

In operations such as those at Verdun the army has to undertake the removal of the civilian populations. Contrary to what might generally be supposed, the rural populations do not flee in terror at the sound of battle. Many of them are so unconcerned at the booming of the guns that they pay little attention to the recommendations to move to the rear, preferring to wait until a military order is given to evacuate the district. Then the army trucks have to come into service, for there are neither railroads nor horses; women, children, and invalids, together with such small hand baggage as it has been possible to save, are loaded into the trucks and taken to the nearest railroad station, from which they can be shipped to some point in the interior. This work, of course, is a considerable addition to the trucks' usual tasks.

Zeppelins Carry Four Six-Cylinder Engines

Details of Motor Equipment of Airship Brought Down in France by Automobile Gun

PARIS, April 14—The complete destruction of a German Zeppelin and its crew by the fire from a French automobile anti-aircraft gun has attracted attention to the role played by the automobile in the war against airships. Although the airship was brought down on Feb. 21, all the facts in connection with its destruction have only recently been made public. There had been considerable aerial activity in the Revigny district, north of Bar-le-Duc and south of Verdun, during Feb. 21. French aeroplanes attacked the invaders, and succeeded in bringing down one of the German machines, while two others dropped into their own lines apparently in a damaged condition.

Picked Up by Searchlights

The same evening about 8.30 o'clock the listening posts announced that two Zeppelins had crossed over the lines near St. Menehould and were working toward the south, evidently in the direction of Bar-le-Duc. Immediately the automobile searchlights were put into action, and two converging rays of light picked up the first of the two Zeppelins flying at a height of 6000 ft. The airship was heading directly toward Revigny station. The Zeppelin discovered, two 75 mm. guns mounted on automobile chassis got into action. In the absence of the superior officer, the two guns were commanded by an Adjutant who ordered incendiary shells to be fired. The first shot passed very close to the airship; the four following shots were placed around the Zeppelin; finally the sixth shot, fired by Gunner Pennetier, passed through the center of the airship from bottom to top. In a few minutes the aerial vessel was in flames, but no perceptible explosion took place. Very slowly the burning airship began to settle down, while pieces of the envelope became detached. After a while the rate of descent decreased and the crew could be seen throwing bombs and other heavy articles overboard, without however, any appreciable result. When at a height of 600 ft. from the ground one of the crew, an underofficer, threw himself overboard. Finally the airship reared and plunged to the earth; the carcass telescoped and the flames completed the destruction. Of the fourteen persons who remained aboard only one could be partially recognized by portions of his uniform. It was discovered that the airship was the L.Z. 77, in charge of Major Horn, of Fribourg. The Zeppelin carried four six-cylinder motors built by Maybach, of 7⅛ by 8⅝ in. bore and stroke, each one weighing 990 lb. The L.Z. 77 carried 1½ tons of bombs, varying in weight from 100 to 220 lb. each.

The automobile searchlights which contributed toward the destruction of the Zeppelin are 30 hp. touring car chassis carrying a searchlight of 24 in. diameter. Several types are in use, but the most common practice now is to have two motors, the smaller one at the rear driving the dynamo which supplies current for the searchlight. This simplifies the construction of the chassis and leaves the main motor free for its ordinary duties. The searchlight is mounted on the center of the chassis, the relative positions thus being: main motor in front under bonnet, searchlight behind driver, auxiliary motor and dynamo at rear. There is thus a radiator at each end of the chassis. In most cases the dynamo is driven by the main motor off the gearset; and on another type the searchlight is carried on a pneumatic tired trailer.

The anti-aircraft gun used for this work is the French 75 mm. field piece designed for high-angle fire and, when directed against Zeppelins, firing incendiary shells. The chassis is a modified 3-ton truck type built by both De Dion Bouton and Schneider, the motor in each case being a four-cylinder of 4.7 by 5.5 in bore and stroke. There is nothing special in motor and gearbox, and final drive is by internal gear. The gun is mounted on a revolving platform immediately above the rear axle, but when going into action the weight is all taken off the road wheels by means of six quick-acting hydraulic jacks. The load is not taken off the front wheels. There is a shield around the front of the gun and the motor is protected against rifle and machine gun fire by means of plating. Twin rubber tires are fitted on rear wheels and singles on the front. In all the latest models cast steel wheels are used in place of the original wood artillery wheels.

Studs Wore Off in 1000 Miles

In a communication by C. C. Hancock, published in the Forum May 4, the following statement was made:

"Two years ago I designed a runabout with live axle and without differential. I ran this 2700 miles and found the tire wear to be extremely rapid, the rubber studs being completely worn off the rear tires in less than 100 miles."

The latter figure was a typographical error, the correct number being 1000.

French 75 mm. anti aircraft gun on 3-ton chassis. Latest type has cast-steel wheels in place of wood

The FORVM

IN HEAVY TRUCKS USING HOTCHKISS DRIVE REAR SPRINGS SOMETIMES BEND WHEN BRAKE IS APPLIED, PERMITTING AXLE HOUSING AND BRAKE CARRIER TO ROTATE AROUND AXLE CENTER

Another Hotchkiss Drive Effect

By H. D. Church,

Chief Engineer, Truck Division, Packard Motor Car Co.

THE writer has read with much interest the article by A. L. Clayden in THE AUTOMOBILE for April 20 in reference to brake action on trucks when Hotchkiss drive is used. The points brought up by Mr. Clayden are important ones, which should be called to the attention of truck designers.

The writer has done quite a bit of experimental work with the Hotchkiss drive on heavy trucks and ran into a condition in connection with hand brake operation which was not referred to in Mr. Clayden's article.

If in addition to choosing the proper eye center locations for the hand brake connecting-rod, as outlined in the article referred to, due consideration is not given to the location of the rear eye in reference to rotation of the entire rear axle casing around its center, due to spring deflection when the hand brake is applied, trouble may be experienced.

The writer has had experience with one design of this type where the brake was automatically applied harder, as soon as it took hold, by the bending of the rear springs, permitting the axle housing and, consequently, the hand brake carrier to rotate slightly around the axle center.

The brake would lock the wheels, and the resultant pull from the rotation of the hand brake support would increase the tension in the brake connections to a point where the hand brake could not be released until the brake had come to a standstill. With a foot brake on the rear wheels this condition, of course, would not exist, as the foot brake is not equipped with a ratchet lock.

The particular case referred to was, of course, an extreme one, but the point is one to be looked out for in the design of brake connections on a spring driven truck, as under severe brake application almost any Hotchkiss drive spring will deflect enough to permit a slight rotation of the axle casing or hand brake carrier around the center of the rear axle.

Change Cycle by Fewer Parts and More Impulses

By James McIntosh

I NOTICE in THE AUTOMOBILE for April 20 an article under the caption Are Other Cycles Possible? J. E. Schipper has treated of several phases of the situation, notably the poor means of control in an automobile engine from an efficiency standpoint. The statement that a motor 20 per cent efficient at full throttle drops to 5 per cent at one-third throttle proves the control is defective and Mr. Schipper's question Are Other Cycles Possible? is, I consider, an admission that the present cycle is not a desirable one. In this I agree with him but have other reasons as to why a change may be advisable.

First, the more impulses per revolution the less each has to be controlled to get results, this to some extent is an answer as to the trend toward multiple cylinders. The result is a multiplicity of parts to regulate and adjust. More constant torque and better acceleration seem expensive adjuncts and the results as to efficiency plus complication show the article by Mr. Schipper is timely. While he offers no solution to the problem, there is one other phase that may be interesting, and the logical control is based on a well recognized and sound principle which I will use to furnish evidence for a change. The early steam engine was controlled by a throttle in the steam pipe and acted on the flow of steam from the boiler to the cylinder. Its function was to reduce the initial pressure to suit light loads and that in turn reduced the mean effective pressure.

Variable Cut-Off Control

The next improvement was a decided change in control with a correspondingly higher efficiency. The variable cut-off constant initial pressure method of controlling is an admitted advantage for variable loads and close regulation.

There is still another condition to be found in our largest transportation problems, both of which use the expansive means of control. The locomotive has a throttle to stop and start with, but the valve gear is so arranged that the cut-off is used to regulate the speed whether the train is a heavy freight or fast mail train. The steamship is also stopped and started by a throttle, but the cut-offs and ratio of expansion in the engine once adjusted decides the power with a boiler pressure and constant initial pressure and a vacuum maintained to a point considered most efficient. It is a well established fact a throttle is not used in the sense it is in an automobile except for small units or where intermittent service and simplicity are virtues. High initial pressures are desirable in a steam engine and no one will say the same applies to a gasoline engine to a lesser degree and back up the statement successfully.

I suggest the more impulses per revolution the less each has to be controlled to get results. This is not advice to add to the number of cylinders. We may get the same number of impulses with half the number of cylinders by making each double acting or by a change in the cycle to make each cylinder deliver twice the number of impulses not justified by a fashion.

Suppose I suggest a change in cycle first to reduce parts; and second to increase impulses per revolution or to get the name number of impulses with one-half the number of cylinders. As a means of control let me suggest a constant volume, constant initial pressure compression and a variable cut-off controlled by a volume of pure air in position to precede a charge of constant and correct mixture and delivering both where they can be most effective.

Let someone question the virtue and my ability to furnish the means and we may have a friendly debate of interest.

The History of the Pneumatic Tire—3

Discovery of Vulcanization by Goodyear in 1835—Hancock's English Patent of 1843—Parkes Discovers That Carbon Bisulphide Is a Satisfactory Solvent — Dietz and Tires

The History of the American Automobile Industry—30

By David Beecroft

AFTER many experiments and probably knowing of the use of sulphur for preventing adhesion, Goodyear discovered vulcanization in 1835 and carried it so far that he produced vulcanite as well. He did not, at this time, make any attempt to secure a patent, possibly expecting to rely upon secrecy. In 1842, he began producing rubber shoes and in that same year samples of his products reached England. There, Hancock, already working in rubber, discovered that the effect was produced by sulphur and secured a somewhat similar result by immersing his product in melted sulphur and then heating it to 302 deg. Fahr. His patent on this process bears the date of 1843. In this year, Parkes of England discovered that carbon bisulphide is a satisfactory solvent and he also vulcanized some products by sulphuric chloride.

In 1846, Hancock introduced the use of molds for forming rubber products. Goodyear secured a second patent in the United States in 1854, but infringements became so common that he was involved in constant fights for his rights, with the result that his patent expired in fourteen years, leaving him penniless and his family in want. He died about this time—July 1, 1860—but Congress, recognizing the work he had done, extended his patent for a number of years.

Dietz Makes First Rubber Tires

The first use of rubber for vehicle tires seems to have been that of Dietz, who, in 1835, patented a rubber cushion applied to the ordinary iron tire and covered with an iron ring or tire so as to get the elasticity without subjecting the rubber surface to the rocks of the road. This recognition of its value, following so closely upon the discovery of Goodyear, shows a wonderful perception of the needs for a shock absorbing tire. The next and even more wonderful, of which there is record, is the pneumatic tire patented by R. W. Thompson, an Englishman, Dec. 10, 1845, his patent number being 10,990, and also patented in the United States in 1847. This patent shows a flat iron tire of considerable width, on the wheel in the usual manner, to which a casing of leather is bolted. It describes and shows a single inner tube and also as many as nine inner tubes, which he explained could be inflated to different degrees, and which, it is quite evident, could have one of them punctured or deflated without seriously affecting the supporting ability of the tire, as a whole. His inner tubes were of several thicknesses of canvas covered "with rubber or gutta percha in solution," and vulcanized by exposure to the fumes of sulphur or by immersion in melting sulphur. He also suggested stuffing the tubes with hair, sponge, or elastic materials, so that in case of deflation the tire would still serve.

A Rubber Cushion

A further suggestion was that of a rubber cushion or liner between the leather case and the air tube or tubes, the original puncture strip. His leather casing was arranged to be laced or riveted along the sides, and the tread portion is shown in some cases provided with rivets or studs, substantially as are leather tire covers of the present day. He says a diameter of 4 or 5 in. is recommended for carriages, which were much heavier in those days than we now know them, and recommends inflation to a point that would permit the tire to flatten approximately one-third of its diameter on a smooth road. So thoroughly practical was the information given by him that one is forced to the decision that he had much experience in the use of these tires at that time, and was not a theoretical inventor, as too often proves true. Carriages fitted with his tires were offered for sale by one or more prominent London carriage houses and *The Scientific American* in 1847 mentioned a carriage equipped with rubber tires on the streets of New York in that year. These were quite probably Thompson's. His application to railroad cars, running on the broad, flat wooden rails of that day, which were about a foot wide by 6 in. thick, shows the wheels with tires fitted just as for road carriages, but the cars were equipped with centrally placed guide wheels which ran each side of a third rail between the regular rails. These guide wheels kept the cars on the track just as modern wheel flanges do.

In 1849, several Philadelphia papers mentioned carriage tires that were proposed to be made of gutta percha. These were doubtless to be of India rubber, it being quite common about that time to confuse the two products. No record of actual construction or use is at hand, however.

The Rostrum

Can Purchase Tire Caliper

EDITOR THE AUTOMOBILE:—Concerning tire inflation discussed March 9, and April 13, I would like to have the following information:

1—Is there a caliper made like that G. A. S. of Boston, Mass., mentions and if so, where can I get one?

2—I have a seven-passenger touring car which I drive a great deal riding alone, weight about 3200 lb., Hudson 6-40, keeping the front tires pumped to 70 lb. and rear 75 lb. When Sunday comes I have seven passengers, so if 70 and 75 respectively are right, how much more tire pressure do I need for the increased load?

3—Is there a chart or scale furnished by anyone that gives the air pressure you should carry in your tires according to the number of pounds or load that each wheel carries?

Yuba City, Cal. H. H. W.

—The tire caliper is made by the B. F. Goodrich Co., Akron, Ohio.

2—If you are using the 35 by 4½ tires you should have 85 front and 90 rear with the full passenger load.

3—This can be secured from any of the larger tire companies.

Haynes Six Makes 3460 R.P.M.

Editor THE AUTOMOBILE:—What is the maximum speed of the Haynes Light Six engine?

Oakland City, Ind. C. R.

—The Haynes Motor Car Co. states that on official tests the maximum speed obtained with the light six motor is 3460 r.p.m.

Ammeter in Gray & Davis Ford System

Editor THE AUTOMOBILE:—Kindly describe the proper installation of an ammeter on the Ford Gray & Davis starter system. Undoubtedly this is a very simple accomplishment but the particular ammeter I have in mind does not appear to be able to stand up under the load subjected to.

Earlville, N. Y. L. L. L.

—An ammeter may be connected into a Gray & Davis system for Ford cars by removing the green wire from the starting switch terminal nearest the battery and connecting this wire to one of the ammeter terminals. From the other ammeter terminal connect a No. 12 insulated wire to the same starting switch terminal.

To determine whether the ammeter is properly connected turn the lights on, engine at rest. Ammeter should indicate discharge amount used by the lights. If charge instead of discharge is shown reverse the wires at the ammeter.

Valve Timing of Lyons-Knight

Editor THE AUTOMOBILE:—Kindly give correct valve timing of the motors in the Lyons-Knight cars. Also bore, stroke, power curve and stock gear ratio.

2—Is the model D-3 Stromberg carbureter suitable for a Stutz motor?

Allston, Mass. S. D.

—The port opening and closing of the Lyons-Knight engine is as follows:

Exhaust opens 63 deg. before end of working stroke.

Exhaust closes 5 deg. before end of exhaust stroke.

Admission opens 5 deg. after beginning of suction stroke.

Admission closes 36 deg. after end of suction stroke.

The bore and stroke of this motor is 4½ by 5½, but no power curve is available.

2—It would be inadvisable to use the D-3 Stromberg carbureter with present-day grade of fuel as this is an old model not suitable to the heavy fuels of to-day.

Cast-Iron Pistons in 1915 Reo

Editor THE AUTOMOBILE:—What kind of pistons are used in the Reo 1915 six-cylinder model M 3.562 by 5.125?

2—The Hudson company claims an increase of 34 hp. making its horsepower 76 without increasing the size of cylinders. How do they get more power?

3—What is the difference between a valve-in-head motor and a Knight motor?

4—Does the National company manufacture its own motor?

Akron, Ohio. G. H.

1—The pistons used are cast iron.

2—The Hudson claim of increase in horsepower is due mainly to a reduction in the internal friction of the engine. They are also using an improved carbureter and have increased the efficiency of the valves.

3—The valve-in-head motor has ordinary valves which seat directly in the head of the cylinder with the stems projecting upward. The Knight motor is an entirely different construction, having two sleeves surrounding the piston with slots cut in the sleeves near the upper end. The sleeves are moved up and down over a small range by means of crankcase and the opening for intake and exhaust is obtained when the slots in the sleeves register, which they are arranged to do at the proper positions in the main piston stroke.

4—The National company manufactures its twelve-cylinder motor, but some of its sixes are made for the company by a firm of engine specialists.

Power Curves of Model 75 Overland

Editor THE AUTOMOBILE:—Will you kindly give power curve developed at different speeds on the 1916 Maxwell and also the model 75 Overland?

2—What is the advantage of a belt drive for generator?

3—What are the six leading cars in production at present?

Lincoln, Neb. C. L. H.

—The horsepower curve of the 1916 Maxwell is not available. That of the Overland 75 is given in Fig. 4.

2—Simplicity and cheapness. It is also silent.

3—Since a large number of the concerns keep their manufacturing schedules a secret THE AUTOMOBILE cannot publish information of this nature.

Explanation of Ford Ignition System

Editor THE AUTOMOBILE:—Kindly tell me all you can about the Ford magneto and the entire ignition system, including a Master vibrator; how the spark is made, etc.

2—Is the Ford a magneto as we understand the word?

Kansas City, Mo. J. K.

—It is impossible to give in this space a complete discussion of all the phases of Ford ignition. The Ford magneto which generates the electric current is the invention of Henry

Ford. It is an integral part of the engine consisting of two sections; one attached to and rotating with the flywheel and the other fastened to the cylinder casting. It eliminates a number of complicated parts as it has no brushes, no distributer, no moving wires or any parts to work loose. It revolves at the same speed as the motor. The magnets on the flywheel passing the stationary coil spools create an alternating low-tension electric current in coils of wire which are wound around spools fastened to the stationary part of the magneto. This current is carried from the coils to the magneto connecting wire leading to the coil box on the dash. The current generated by the magneto flows through the primary winding of the coils in the coil box on the dash to the commutator located at the front end of the engine just under the oil breather pipe, back through the frame of the motor to the magneto. This completes the primary surface or path of the magneto current. The high tension current induced into secondary winding of the coils is led to the spark plugs in the cylinders as their respective circuits are completed by the commutator.

2—Yes.

Power Curves of Four Overland Models

Editor THE AUTOMOBILE:—Kindly publish complete power curves of Overland models 75, 83D, 84 and 86.

New York City. J. F. W.

—The power curves of the four Overland models you request are published herewith. Model 86 in Fig. 1, 83-D in Fig. 2, 84 in Fig. 3 and 75 in Fig. 4.

Dash Gage for Rear Tank

Editor THE AUTOMOBILE:—Is there now on the market any mechanical device for indicating on the dash or cowl board just how much gasoline the driver has when the gasoline is carried in a tank in the rear? In other words, is there a dash indicator for rear gasoline tanks?

Flint, Mich. J. E. G.

—Yes, there are a number of cars which are regularly equipped with devices of this nature.

Why Fours Are Not V Types

Editor THE AUTOMOBILE:—Why are not four-cylinder motors built in the V type?

2—Please state disadvantages of this type of motor.

3—Would a motor of this design be more rigid than the regular four in a row?

Syracuse, N. Y. C. A. McV.

—Dividing 360 deg. by four, it is found that the crankshaft throws are 90 deg. apart. With this arrangement the cylinders can be advantageously set on a line and there is no reason for the V.

2—No marked disadvantages have been found except perhaps the added care necessary to have everything accessible.

3—Not necessarily so.

Buick and Chevrolet Not Connected

Editor THE AUTOMOBILE:—In THE AUTOMOBILE for April 27 mention is made by one of your correspondents of the McLaughlin-Buick car. What car is this and what does the name McLaughlin signify when used in connection with Buick?

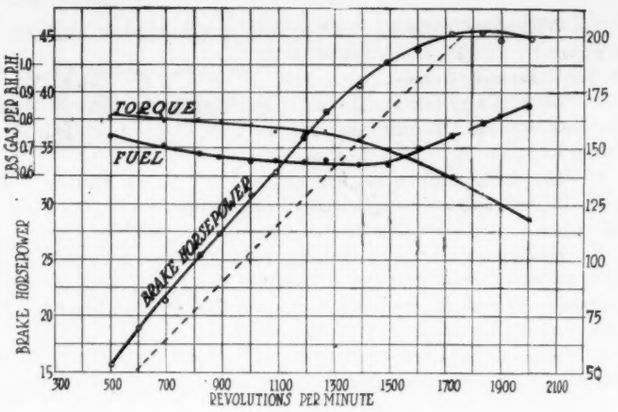
2—How did the name Buick originate?

3—Who designed 1916 Buick cars?

4—What connection if any, exists between the Buick and Chevrolet companies?

5—Were these cars designed by the same engineer?

6—The cylinder capacity and weights of the Buick D45 Six and the 1916 Studebaker Four are approximately the same. Which is the speedier car?



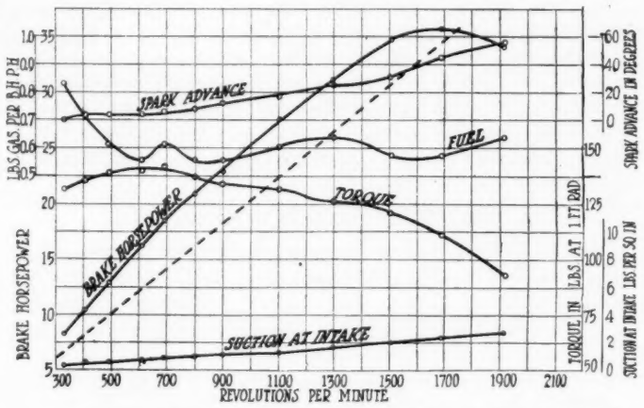
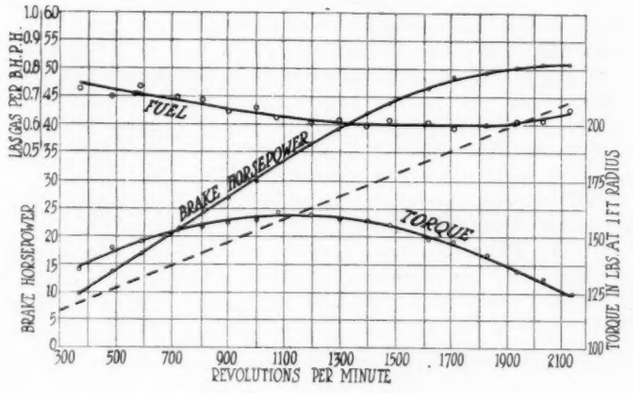


Fig. 1—Top, power, fuel and torque curves of the Overland model 86

Fig. 2—Bottom, power, fuel and torque curves of the Overland model 83 D



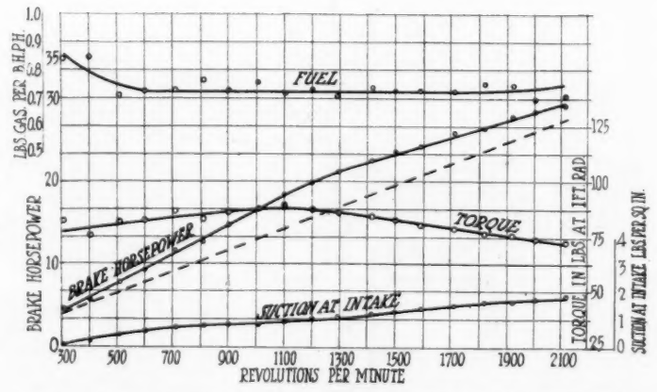


Fig. 3—Top, power, fuel and torque curves of the Overland model 84

Fig. 4—Bottom, power, fuel and torque curves of the Overland model 75

7—Why does running with a late spark tend to overheat a motor?

East Canaan, Conn. D. C. C.

—The McLaughlin-Buick car is the Buick car assembled in Canada by the McLaughlin Motor Car Co., Ltd., Oshawa, Ontario.

2—The Buick car takes its name from D. D. Buick, who was the founder and organizer of the Buick Motor Co., Flint, Mich.

3—The Buick company employs a large corps of engineers, and all of these men have a hand in designing new models, although Mr. Walter L. Marr, who is the chief engineer, assumes the responsibility for this work.

4—There is no connection whatever between the Buick company and the Chevrolet Motor Co.

5—No.

6—THE AUTOMOBILE has no record of any contest of speed between these two makes of car.

7—Overheating is due to a late spark because combustion takes place so late that the gases have not had opportunity to be cooled by expansion before the exhaust opens. The result is that the engine runs much hotter than it would if explosion occurred on upper dead center as it is supposed to do.

Lubricating System of Grant Six

Editor THE AUTOMOBILE:—Please describe and illustrate the oiling system of a 1915 Grant six. Give horsepower curve of this motor.

2—Are the valves of the Franklin motor placed in cages or directly in the cylinder head?

3—What kind of wood is used for the frame of this car?

Tipton, Ind. E. G. D.

—Illustrations of the lubricating system of the Grant six are given in Figs. 5 and 6. The method of oiling is along conventional lines, the oil being drawn through a strainer in the oil sump, forced through a sight feed on the dash and through two discharge pipes from this sight feed. One of the discharge pipes goes to the motor gears and the other to the rear end of the motor from where it is distributed to the oil troughs.

The illustration of the pump in Fig. 5 shows a novel arrangement in the form of an air chamber on the pump which allows a steady flow of oil.

2—The valves are placed in the cylinder head; are inclosed and mechanically operated.

3—The Franklin frame consists of three plies of second growth ash of equal thickness, being glued and screwed together and bound on the top and bottom by a thin strip of the same material to cover the joints. The wood is carefully selected for grain and is kiln dried and seasoned in the open air. A thorough painting treatment is used to protect the wood from moisture.

Austin 77 a Six-Cylinder

Editor THE AUTOMOBILE:—Kindly give me the bore and stroke, number of cylinders, wheelbase and horsepower of the Austin 77. Who is the nearest agent?

New York City. J. E.

—The Austin 77 had six cylinders, bore and stroke 4½ by 7 and a horsepower rating according to the S. A. E. formula of 48.6. The motor was T-head design with the cylinders cast separately. The wheelbase of the Austin 77 was 141 in. and the tire size 37 by 5.

THE AUTOMOBILE has no list of Austin agents. This can be secured from the Austin Automobile Co., Grand Rapids, Mich.

Information on Midland Car

Editor THE AUTOMOBILE:—Where was the Midland car made?

2—How many years did the company manufacture cars and at what price?

3—Where can I purchase parts of the Midland car?

4—What motor did they use and what size bore and stroke?

5—What speed could they make?

Lee, Ill. E. W.

—The Midland car was made by the Midland Motor Car Co., Moline, Ill.

2—This company manufactured at least from the year 1908 to the year 1913. The cars manufactured were in accordance with the following table:

1908-9-F	30-35 hp.	Roadster	$2,000
1908-9-G	30-35 hp.	Touring	2,250
1908-9-G-10	30-35 hp.	Touring	2,500
1908-9-F-9	30-35 hp.	Touring	2,250
1908-9-E	25-30 hp.	Touring	1,958
1910-G-10	40 hp.	Touring	2,250
1910-L	35 hp.	Runabout and touring	1,750
1911-L1-L2	40 hp.	Runabout	1,950
1911		Touring	2,000
1911		Torpedo-touring	2,100
1911-K	50 hp.	Touring	2,250
1912-O-6-60	60 hp.	(6 Cyl.) Roadster	3,000
1912-L-111	40 hp.	Roadster	1,900
1912-R	40 hp.	Touring	2,750
1912		Coupé	3,000
1913-W	40 hp.	Touring	2,100
1913-T-4-40	40 hp.	Roadster and touring	1,685
1913	40 hp.	Coupé	2,350
1913-T-6-50	50-60 hp.	Roadster	2,385
1913	38 hp.	Touring	2,450
1913	38 hp.	Coach	3,250

3—From the Maxwell Motor Co., Newcastle, Ind., or the Midland Motor Co., Moline, Ill.

4 and 5—THE AUTOMOBILE has no complete record of this information.

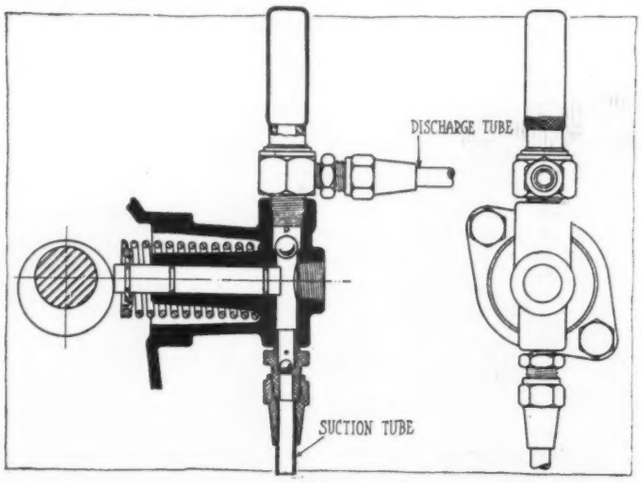


Fig. 5—Oil pump used in the Grant six, showing the air chamber which allows a steady flow of oil

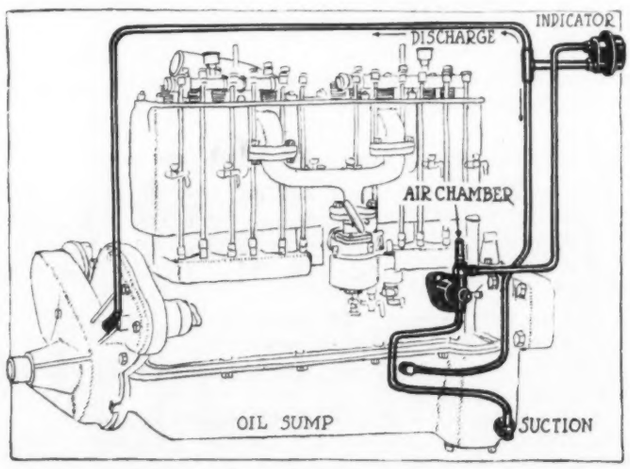


Fig. 6—Diagram of the lubricating system on the Grant six, showing the various leads

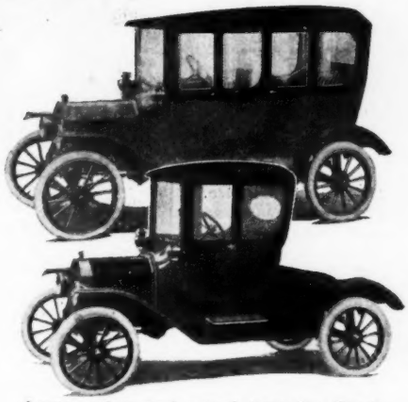
ACCESSORIES

Cassco Tire Pump

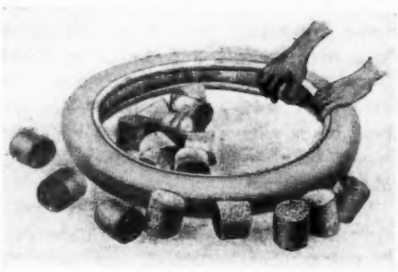
THIS pump, which is just being put on the market, is very compact, and the makers pride themselves upon the materials used and the workmanship employed in its construction. The cylinder and crankcase are of heat-treated cast iron accurately reamed and burnished. Pistons are of special aluminum alloy iron, and the piston guides are two parallel rods inserted in the lower surface of the piston and at right angles to its horizontal plane. These rods slide easily without play in two lugs, the holes being accurately machined. The lugs are integral with the base of the cylinder. This construction makes perfect alignment of the piston and cylinder walls certain, and prevents side play of the piston. This is a distinctive feature of the Cassco pump.

Piston rings are of special soft spring steel pressed and ground to size, each piston having three rings, thus preventing oil leaking into the tire and the consequent deleterious effect on the rubber. The crankshaft is of high-grade steel with a bearing on each side, thus avoiding overhanging loads. The connecting-rod is of special semi-steel and the gear shift is positive in action, automatically locking in both the engaged and disengaged positions. This prevents stripping the gears. Poppet type intake and exhaust valves of the same size are used, the intake being automatic in action, the air entering the cylinder the instant the piston begins its intake stroke. Gears are made with the stub form of tooth, and are accurately cut. The stroke of the pump is 1 in. and the bore 2½ in., giving a piston displacement of 5 cu. in. Lubrication is by splash and a felt lubricator which distributes oil to all working bearings.

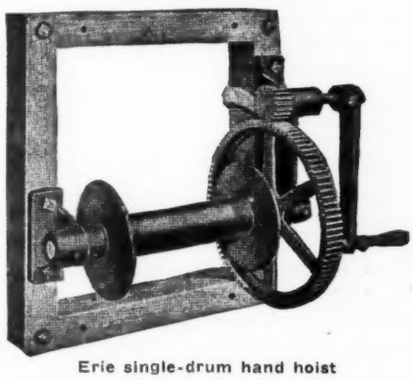
The pump may be easily installed by the car owner using a screwdriver and wrench, as special brackets and fittings are provided for installation. No machine work or shipping is required. Cassco pumps are now ready for Buick, Chandler, Chevrolet, Dodge, Ford, Hudson, Hupmobile, Maxwell, Overland, Reo the Fifth, Saxon and Studebaker cars. Complete with gage, hose and complete instructions for installing, the pump sells for $8.—Edward A. Cassidy Co., Inc., New York City.



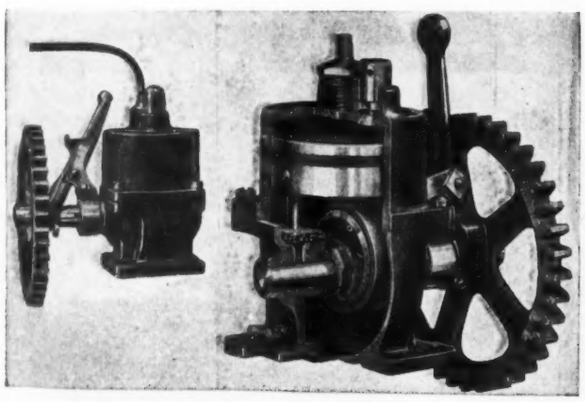
Ames sedan and coupé tops for Fords



National rubber tire filler



Erie single-drum hand hoist



Left—The new Cassco tire pump. Right—Multibestos brake lining cutters

Ames Detachable Bodies

The same general type of construction is used in the Ames sedan and coupé tops. Framing is of hard wood, roofs full slatted, padded and covered with enameled full grain muleskin leather, with blind welts, watershed moulding. The glass is 3/16 plate set in cushioned mouldings. Door lights are fitted with patent lifts, windshield is automatic hinged, rain vision, ventilating. The makers state that these tops make the Ford practically as snug and tight as a built-on top. Lining is of gray whipcord and a dome light is provided. All joints are so made that there is no squeak or rattle. Net weight of sedan top, 150 lb.; of coupé top, 100 lb. The sedan type lists at $97.50.—F. A. Ames Co., Inc., Owensboro, Ky.

Erie Hand Hoist

Two capacities of single-drum hoists are made, one of 900 lb. and one of 1200 lb. The frame is of pine. The former weighs 95 lb. and the latter, 140 lb. Price, type 220, $28; type 221, $36.—Erie Hoist Co., Erie, Pa.

Standard Brake Lining Cutters

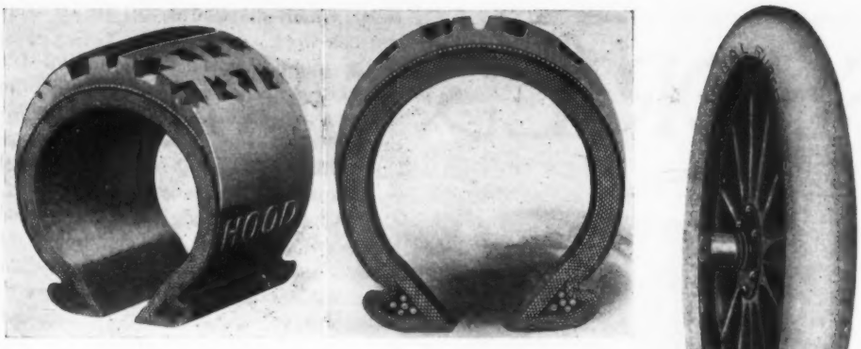
This is a special tool of the shear type, designed especially for cutting brake lining, but useful also for cutting cable, wire or light sheet metal. The handles are long, give the requisite leverage and the blade is of hardened steel, easily removable for sharpening.—Standard Woven Fabric Co., Framingham, Mass.

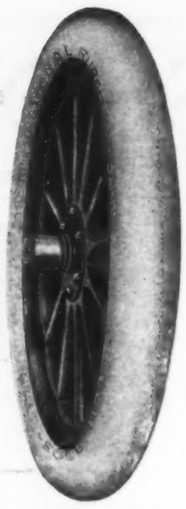
Pedex Extension Pedals

The purpose of these pedals is to make it easier for women drivers to operate a car. They are made to fit any make of car and do not interfere with the operation of the regular pedals. Price, $5 per pair.—American Car Accessories Co., New York City.

National Tire Filler

This is a tire filler made up in short sections. The makers state that high grade rubber is cut into small particles and vulcanized together by a process that results in great resiliency. The sections fit the tires for which they are made accurately when the tires are pressed into





Left — Hood tire, showing the tread and cross sections. Right—International Half-Sole tire

place. Tools for the purpose are furnished free with a set of four fillings. Prices range from $13.50 per tire for 28 by 3 to $39 for 37 by 5½; Ford size, 30 by 3, $14; 30 by 3½, $18; 34 by 4, $25.50; 36 by 4½, $30.—National Rubber Filler Co., Midlothian, Tex.

Shi-Nup Enamel Cleanser

Shi-Nup is not a polish in the ordinary sense of the word, but a cleanser, according to the descriptions furnished by the manufacturer. It does not re-surface the part to which it is applied, nor leave a covering of wax, oil or grease. It contains no acids or combustibles. The manufacturer says it will restore the original luster of the finish. It is adapted to use on fenders, hoods and parts finished under heat treatment. A quart is said to be a large enough supply for a season. It is sold in quart cans at $1, and in pint cans at 50 cents per can.—Shi-Nup Corp., Yonkers, N. Y., manufacturer; Rose & Hibbard, Yonkers, N. Y., wholesale distributor.

Hood Tires

Hood tires are put out with the idea of producing the best possible wearing surface without regard to cost. The result is that, owing to the extra fabric plies, extra rubber quality and extra tread thickness, the cost is higher than that of the standard makes. One tire, however, made by the same concern under the brand name of Puritan is of standard construction throughout as to number of plies, strength of fabric and quality of rubber. It has, in addition, an extra thick tough resilient tread. This tire sells at the standard price. It is made with a gripper non-skid tread, which gives a good surface for slippery roads but is not as skid-proof as the regular Hood treads.

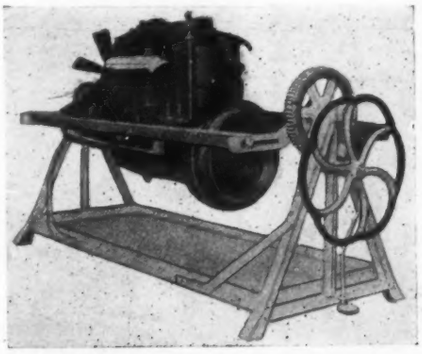
In order to maintain a standard compatible with the slightly higher price, the Hood tires are made with an extra ply of fabric, having on the small sizes one more and on the larger sizes two more plies than the ordinary type of tire. The fabric is of the highest quality of Egyptian staple woven to Hood specifications, and every roll is tested before using. The rubber is selected from the best grades of plantation and para. This is compounded only with sulphur.

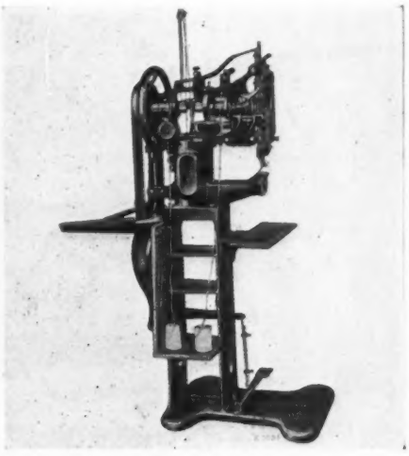
The beads are locked in and so constructed that rim cutting is practically eliminated. The cushion and breaker strips are made extra wide, giving the tire extra strength and rendering it difficult to puncture. The tread is tough and extra thick, with a depressed arrow type tread made with arrow-shaped insertions having very sharp edges which hold the road by suction.

Although the first cost of these tires is higher than the standard tire because of the extra construction, the makers claim that the first cost is justified by the extra mileage and they state that during 1915 the adjustments made on tires which came back to the factory on the basis of 5000 miles was less than one-half of 1 per cent.—Hood Rubber Co., Watertown, Mass.

International Half-Sole Tires

These Half-Sole tires are a trademarked product, the manufacturer stating that they are built like the highest grade tires, with the exception of the bead, being really outer tires to go over worn tires. There are three to six plies of tire fabric solidly vulcanized together, a thick cushion of elastic rubber which protects the fabric from breaks and ruptures and the outside tread which is made of ½-in. or more of very tough live rubber. The use of these Half-Sole tires on worn shoes is said to double or treble the mileage obtained. They are made to fit any kind of tire, and the rim can be of any type. The Half-Soles carry a guarantee against puncture and the price is about half that of a new tire.—International Rubber Co., Denver, Col.





Above—St. Albans rotating motor rack
Right—Singer tire retreading machine

Singer Tire Retreading Machine

This machine is for stitching two old casings together to make one good casing. The outer one has the bead removed and then it is sewed in place with two rows of lock stitches. Price, $275 cash, or $100 down and $25 per month for eight months.—Singer Sewing Machine Co., New York City.

St. Albans Motor Rack

A motor may be clamped or bolted and in this rack turned to any position from right side up to upside down. The motor is secured to longitudinal rails which are adjustable as to their distance apart. The frame holding the motor is rotated, through gearing, by a handwheel. There are twelve positions in which the motor may be held, and a stop, actuated by a pedal, is provided. The gearing is 6 to 1, so that even a heavy motor is easily handled. A removable drip pan at the bottom catches all oil and dirt. The stand is built of heavy angle steel and is so strong that a motor may be driven by belt from an overhead shaft while bolted in the frame. The side rails are so heavy that they can be drilled for bolts without unduly weakening them; the holes will be drilled by the makers if exact measurements or templets are suplied. In the absence of bolt holes the motor may be held by hand clamps. The largest size, model 400, will take any size of motor; the smallest is 30 in. long and the side rails are adjustable from 10 to 24 in. apart. Prices, model 100, $32.50; model 200, $35; model 300, $38.50; model 400, $42.50.—Foundry Motor Car & Mfg. Co., Inc., St. Albans, Vt.

The Automobile

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Stock Car Performance

THERE are many in the industry who remember with pleasant recollection the days of stock car racing, just as there are a few whose remembrances are less inspiring, but one and all will join in admiring the perfomance of the Hudson in the Metropolitan Trophy 150-mile race. Of course, this chassis was carefully prepared; it was treated just as the amateur drivers in England treat the stock cars they use for the monthly afternoon of racing on Brooklands, but this did not alter the fact that the chassis was designed and built without any regard to its use in this way. Ira Vail's performance shows what splendid racing a field of good stock chassis could provide, and it will be interesting to observe whether the modern stock car is not capable of beating regularly the type of hybrid vehicle which commonly makes up the tail in the big speedway events. A good stock car gone over carefully to see that all the fits are correct is better as a speed machine than an old racing car which is wearing out. The maximum speed may not be quite so high, but the reliability is far greater and in modern automobile racing, on board, cement, brick and asphalt-surfaced speedways, it is reliability rather than sensational speed which most frequently figures as the determining factor in the order of finish of the participants. It is the old fable of the hare and the tortoise over again; the race is not always to the fleetest.

Oil and Metal

FROM an engineering viewpoint the racing at Sheepshead Bay last week proves two things. The first is that design has reached a point where it is restrained by strength of materials. The second is that the efficiency of lubrication required by racing engines on such speedways is far above any other need of the kind.

Simultaneously we see that ignition trouble, so prevalent last year, has been overcome completely. In all the racing on May 13 not a single spark plug was changed, except as a precaution, between races.

Toward the close of the 1916 season of racing it was noticed that broken connecting-rods were common. Fatigue of the metal was suggested as a possibility, as also was the notion that perhaps sections had been reduced too far in the effort to cut down reciprocating weight. Here, obviously, the metal available limits the lightness of the design.

Pistons Also Affected

We have, however, seen several piston failures which may not be explicable on the same supposition, and it is even possible that some of the connecting-rod failures are traceable to lubrication failure, rather than to anything else. If the frictional resistance of the piston increases suddenly in a motor running at 3000 r.p.m. the stresses on the piston itself, and on the connecting-rod may increase enormously. If, for example, the lubrication fails partially, so that the piston grows only a trifle tighter than normal, the pull on the connecting-rod at the instant of reversal of motion at the top of a stroke can be made much larger. It does not require a frozen piston to do damage in a very high speed engine; one that is merely rather tight is quite enough to put it out of the running.

Similarly with bearings. With the ball bearing crankshaft and with shafts on plain bearings there is rarely any trouble in the main bearings, but the lower ends of the connecting-rods are in a very different case. With a ball-bearing crank pressure lubrication for the lower ends is impossible. With a plain bearing crank the pressure and amount of oil supplied to the lower ends cannot be as great as in the main bearings. At the same time, it is the lower end bearings that have the most severe stresses to bear. Racing engines to-day are destroyed if the efficiency of the lubrication falls off, even for an instant. The avoidance of trouble is as much a matter of extreme care in preparing the car as it is a question of design. In an ordinary engine the lubrication provides a large factor of safety, whereas in a racing engine it has scarcely any factor of safety whatever. Of the leading cars on the speedways this season there is little difference in the power obtained, there is little difference in the weights, and the design in each case ranks very high indeed. Thus the success of one car or another is more than ever bound up in the treatment it receives. It is the supremely careful overhaul before the race compared with the hasty one that is going to make the difference between first place and collapse when the test comes.

France Bars Cars and Parts

Prohibits Importation of Chassis, Bodies, etc., from England and United States

PARIS, May 15—*Special Cable*—Without the slightest warning, the French Government has prohibited the importation from the United States and England of automobile chassis, with or without motor or body, automobile coach work and other automobile parts.

The decree contains a clause authorizing the Ministers of Commerce and Agriculture to make exceptions and permit, under conditions to be determined by the Minister of Finance, the importation of particular articles. No official explanation has been made, but it was said that the new ruling undoubtedly had been put into effect with a view to procuring more space in vessels coming to French ports for supplies the Government needs.

—

N. A. C. C. to Conduct Educational Campaign on Credit Plan

NEW YORK CITY, May 17—In view of certain advertisements which have appeared relative to buying automobiles on the deferred payment plan and the use of the names of certain cars without authorization from the manufacturers, the National Automobile Chamber of Commerce at its directors' meeting on May 3, voted to institute a broad and vigorous campaign of education, not alone among publishers, but among members of the N. A. C. C., calling attention to the fact that widespread advertising of credit plans is detrimental to the industry; that members be encouraged to avoid adopting policies which may undermine the business and that they be encouraged to pursue those policies which can alone maintain and continue permanent success. The resolution is:

"Whereas, Certain influences are working and certain efforts are being made for the organization of plans which will have a disastrous undermining effect on the stability of the automobile industry, and

"Whereas, It is the opinion of this committee that injurious results will follow the adoption of these methods by any considerable number of automobile manufacturers, and

"Whereas, The methods of deferred payments under consideration are very objectionable from the factory standpoint, and are objectionable to a large degree from the dealers' standpoint, and have a disastrous effect on the purchasing public, which will unavoidably react injuriously, now therefore be it

"Resolved, That a broad and vigorous campaign of education be conducted by the National Automobile Chamber of Commerce, instructing and enlightening its membership along these lines and calling their attention to the fact that methods which on superficial consideration, seem to have merit, are in reality potent forces for destroying the foundation on which our industry has been builded, and that every effort be made to encourage the membership to avoid adopting policies which will undermine the stability of the industry and to encourage them to pursue and develop those policies which can alone maintain and continue permanent success."

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Two Velie Worm-Drive Trucks

MOLINE, ILL., May 14—Two worm-drive trucks are now marketed by the Velie Motor Vehicle Co., this city. They are known as the models 25 and 26 and are rated respectively at 1½ to 2 tons and 3½ tons. In design both trucks are similar except in point of size. The motors are 4⅛ by 5¼ and 4½ by 5½ of Continental manufacture controlled positively by a gear-driven centrifugal governor. The radiator tubes are removable and the whole radiator assembly is mounted on springs to absorb the shocks.

Velie Biltwel trucks are completely equipped with top over driver's seat, seat and cushion, gas headlights and Prest-O-Lite tank, oil lamps and full set of tools. Later in the summer an additional model will be added.

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$1,100,000 Miller Rubber Preferred Subscribed in 1 Hour

CLEVELAND, OHIO, May 16—A syndicate headed by Borton & Borton and including Hayden, Miller & Co., of this city, and Field, Richards & Co., for the Cincinnati market, yesterday offered $1,100,000 of the new Miller Rubber Co. preferred stock at 105. The offering was more than covered within an hour.

Of this issue there is to be authorized a total of $10,000,000, of which $2,000,000 is for immediate issue. Of the latter $600,000 is to be used in exchange to retire the present issue of $500,000 and the balance was reserved for subscription by shareholders and by officials of the company.

This offering, together with the recent Goodyear financing, makes a total of close to $20,000,000 of new rubber preferreds taken by the markets within the past week or so. Eliminating the stock taken in exchange for existing issues, there has been marketed approximately $12,000,000 of these securities. The spontaneous response of the investment public shows the high standing they have attained in the investment markets, both in Ohio and throughout the country.

80% Stock Dividend for Paige?

Increase of Capital to $2,000,000 Also Proposed—Meeting May 24

DETROIT, MICH., May 11—At a meeting of the directors of the Paige-Detroit Motor Car Co., held here to-day, recommendations were made that a stock dividend of 80 per cent be declared, that the capital stock be increased from $1,000,000 to $2,000,000, and that the par value of the stock be reduced from $100 to $10. These recommendations will be submitted to the stockholders at a special meeting that has been called for May 24, and it is practically certain that they will be adopted.

May 30 Is Proposed Date

According to the plan formulated by the directors at this meeting, the 80 per cent stock dividend will be issued from $500,000 of the present authorized capital stock that has been held in the treasury. At the present time the outstanding capital stock is $500,000, and the stock dividend on this will represent stock of a par value of $400,000. It is proposed to pay for the additional stock to be issued by transferring from the surplus account to the capital account $400,000. Even after doing this, it is said that the accumulated surplus will still be in excess of $250,000. The Detroit Trust Co. is transfer agent, and it is proposed to issue the stock dividend to stockholders of record at the close of business May 30.

Second Dividend

The Paige company has enjoyed a rapid growth and has been a big earner for its stockholders for some time. It was originally formed in 1909, with a capital of $100,000, all subscribed. The present stock dividend is the second distribution within a year. On Aug. 2, 1915, a stock dividend of 100 per cent was distributed, the outstanding capital at that time being $250,000. For some time past the concern has paid regular monthly dividends of 5 per cent cash. The year following its formation, the Paige concern increased its authorized capital to $250,000, of which $136,000 was paid in, and in October, 1914, the balance of $114,000 par value of stock, which had been held in the treasury, was issued to the stockholders at par, raising the outstanding stock to $250,000. In June, 1915, the capital was increased to $1,000,000, half of which was left in the treasury.

To-day the stock was selling on the Detroit Stock Exchange with bid quotations at $860.

A Transcontinental Record

Baker Drives Cadillac 8 from Los Angeles to New York in 7½ Days

NEW YORK CITY, May 17—Shattering all previous automobile records by dashing across the continent in seven days, eleven hours and fifty-two minutes, E. G. Baker, accompanied by W. F. Sturm in a standard Cadillac eight, arrived here May 15.

The car left Los Angeles, Cal., at 12.01 on May 8, and, covering the distance of 3380.7 miles to this city, arrived at Broadway and Forty-second Street at 2.53 p. m. The original mileage, 3471, as given out by the Cadillac company, was an error.

The former record was eleven days, seven hours and fifteen minutes, made by Baker and Sturm in a Stutz last May. On that trip the distance covered was 3728.4 miles.

On both trips Baker was the only driver, getting only nineteen hours' sleep on the last trip.

Deplorable road conditions were encountered and much difficulty in getting through mud holes was also experienced. Baker states that he could have negotiated the distance in one day less but for the poor weather conditions and bad roads. Rain at Kansas City held him up practically one day. The hardest riding was through Missouri, where at one time the car was only able to make 10 miles in two hours.

567.2 Miles In 1 Day

The longest distance covered was 567.2 miles on the third day's run into Dodge City on May 11. The total for the three days was 1655.9 miles. This was an average of over 551 miles daily and an average of 20.9 miles for every hour of the twenty-four. In 1915 Baker went by way of Phoenix, Ariz., and El Paso, Tex., before heading northward through Texas into Kansas. Baker's mileage the first three days of last year's run was 1245.5, as compared to 1655.9 miles for the first three days this year.

Comparing this time with that of a railroad train, it is shown that the latter takes ninety hours between Los Angeles and New York City to cover a distance of 3240 miles and uses over twenty locomotives.

The roads in Arizona were so bad that most of the running was done in intermediate gear. A great deal of the running was also through mountains, where an altitude of 6500 ft. was reached at one time.

The only trouble which happened to the car was a leaky oil pipe which cost the transcontinentalists 2½ hr. This trouble occurred between Barstow and Needles. The hood of the car was not lifted during the trip.

On the last stretch homeward Baker determined to make up for lost time. His last dash of 1028 miles from St. Louis to New York City took him 37 hr. and 17 min.

Notwithstanding the low gear work through Missouri and Arizona, the car managed to make from 9 to 10 miles per gallon of gasoline and from 320 to 350 miles per gallon of oil.

Last night a testimonial dinner was given Baker and Sturm at the Hotel Astor, where they spoke of their experiences on the run. Baker stated at one time he drove 84 miles without going out of intermediate gear. Only thirteen tire changes were made. The worst was through the Mojave Desert, where the thermometer stood at 120 deg. There, five tire changes were made. The usual pressure of the tires had to be reduced 15 lb. on account of the heat.

The car was equipped with U. S. tires, Delco starting and lighting system, Stewart-Warner speedometer, A-C spark plugs and Kelsey wheels.

The following gives the runs between evening stopping stations:

Williams, Ariz.	553.5
Santa Fé	555.0
Dodge City	567.2
Kansas City	401.0
High Hill	216.0
Greenup, Ill.	210.0
Pittsburgh	493.0
New York City	385.0

The mileage of the route which Baker and Sturm followed is as follows:

Los Angeles to San Bernardino	63
To Barstow	79
To Needles	165.8
To Kingman, Ariz.	72
To Williams	138.5
To Flagstaff	34.8
To Albuquerque, N. M.	381
To Santa Fe	66
To Las Vegas	72.9
To Raton	136.6
To Trinidad, Col.	25
To La Junta	94.2
To Syracuse, Kan.	114
To Dodge City	104.8
To Hutchison	153
To Florence	121.7
To Kansas City, Mo.	134.5
To Columbia	159
To St. Louis	140.7
To Greenville, Ill.	52
To Columbus, Ohio, via Indianapolis	322.1
To Greensburg, Pa.	303
To Philadelphia	275.8
To New York	103
Total	3,380.7

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Hudson Raises Prices $100

DETROIT, MICH., May 13—On May 9 the Hudson Motor Car Co. advanced the price of its various models fitted to the Super-Six chassis by $100, but public announcement of this change was not made until to-day. The new price on the phaeton model and the two-passenger roadster is $1,475, while the four-passenger roadster type now sells for $1,525; the cabriolet at $1,775 and the sedan at $2,000. Greatly increased materials costs are responsible for the change.

$60,000,000 Merger Formed

Perlman Rim, Delco, Remy, Hyatt and New Departure Companies Included

NEW YORK CITY, May 12—A giant merger of five leading parts and accessory making concerns has been consummated in the name of the United Motors Corp., with 1,200,000 shares of stock of no par value. The capital involved is nearly $60,000,000 and the concerns merged are the newly organized Perlman Rim Corp., New York and Jackson, Mich.; Dayton Engineering Laboratories Co., Dayton, Ohio, maker of the Delco electric apparatus; Remy Electric Co., Anderson, Ind., and Detroit, maker of electric apparatus; Hyatt Roller Bearing Co., Newark, N. J., and Detroit, manufacturer of roller bearings, and the New Departure Mfg. Co., Bristol, Conn., maker of ball bearings. The new concern will be the holding company.

The company is incorporated under the laws of New York State. Each company in the merger will retain its identity and the management of each will remain in the same hands as heretofore. The board of directors of the parent company will consist of representatives of the management of the subsidiary concerns, as follows:

Directors Elected

For the first year the directorate will be composed of A. P. Sloane, Jr., Hyatt Roller Bearing Co.; E. A. Deeds, Dayton Engineering Laboratories Co.; DeWitt Page, New Departure Mfg. Co.; S. A. Fletcher, Remy Electric Co., and L. G. Kaufman, president of the Chatham & Phenix National Bank, with the following officers: A. P. Sloane, Jr., president; A. E. Deeds, vice-president; DeWitt Page, secretary and treasurer, and L. G. Kaufman, chairman of the finance committee.

W. C. Durant, president of the Chevrolet Motor Co. and a big factor in the General Motors interests, is one of the principal figures in the new accessory combine as well as the newly organized Perlman rim concern. It is understood that the Perlman concern enters the merger on the basis of two shares of the new stock for each share of Perlman rim stock.

The stock of the United Motors Corp. has been oversubscribed by the syndicate in the neighborhood of three times. The banking houses of issue are Dominick & Dominick, J. S. Bache & Co. and W. W. Laird of Wilmington, Del. Dominick & Dominick are managers of the syndicate of bankers underwriting the stock of the corporation.

Noronic Is Oversold to S. A. E.

All Cabins Full—Forty Names on Waiting List—Program of Papers

NEW YORK CITY, May 17—Advice has been received from Detroit that the steamship Noronic, on which the Society of Automobile Engineers will take its summer cruise June 12 to June 16, is oversold, there being already forty more applications than there are berths available. The papers committee is nearly ready to announce its program which includes a wide variety of subjects and promises to be the best the society has ever had.

An endeavor is being made to find accommodation on the boat for two simultaneous meetings so that papers on widely different subjects can be read at the same time. This will allow a much larger number of papers to be read and is expected to be much appreciated.

S. A. E. Standards Program

During the coming week there will be a number of meetings of divisions of the standards committee commencing May 22. On May 24 at 10 a. m. at the society's headquarters in New York the sub-committee on lamp standards appointed by the electrical equipment division will hold its first meeting under the chairmanship of W. E. McKechnie of the Cadillac Motor Car Co. On the same date the other sub-division dealing with starting motors and generators will meet in Detroit. The nomenclature division has a meeting in Detroit on May 25, when it is hoped to practically complete the work of its division so that a complete report can be presented to the summer meeting.

Other Meetings

The miscellaneous division meets in Detroit May 26, and the engine and transmission division in Detroit May 27, while the research division has a meeting at Indianapolis on May 29.

With respect to the meeting of the subcommittee on starting motors and generators, which is composed partly of members of the electrical equipment division; invitations have been issued to other engine makers and to manufacturers of starters and generators to attend this meeting and join in the discussion of the general possibilities.

Tire Division Appointed

The council of the S. A. E., by a mail vote, has decided to establish a tire and rim standards division to handle all matters concerning solid or pneumatic tires and rims. The membership will include representatives of all the solid tire and rim makers, and it is hoped to complete the personnel in time for a meeting to be held previous to the general meeting on the Noronic. This division will take over the truck standards division, a certain amount of work in the nearly complete state and expects also to proceed actively with the standardization of felloebands of pleasure car wheels, thus taking over the work of the pleasure car wheels division, which was discontinued some time ago.

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Electric Vehicle Section of N. E. L. A. Meets May 22-26

CHICAGO, ILL., May 17—On Monday, May 22, the National Electric Light Assn. will commence its annual meeting, which lasts till May 26. It will be remembered that the Electric Vehicle Assn. recently amalgamated with the N. E. L. A., becoming the Electric Vehicle Section of that body, and this section will present to the meeting a number of interesting papers and reports.

The Papers

Prominent among the readers of papers are well-known S. A. E. members. William P. Kennedy, chairman of the S. A. E. truck standards division, will read a paper dealing with the ability of central stations in the promotion of the use of electric vehicles. E. P. Chalfant, another member of the S. A. E. standards committee, has a very interesting paper on the problems concerning electric passenger vehicles. He analyzes the respective fields of gas and electric cars in detail. F. E. Whitney has a paper analyzing truck troubles and their elimination. S. V. Norton of the B. F. Goodrich Co. is contributing a long paper on tires in relation to electric vehicle efficiency. P. D. Wagoner of the General Vehicle Co. submits some valuable data regarding the battery service system. Industrial truck application, drawing attention to the very wide field of this modern machine, is the subject of the paper by C. W. Squires, and Harry Salvat in a short paper calls attention to the opportunities which the electric car offers to garage owners.

Federal Use of Trucks

The largest document to be presented to the meeting is the report of the committee on Federal and municipal transportation. This discusses the public service uses of electric vehicles and illustrates a large number of trucks in municipal service of all kinds.

The report of the standards committee refers to the fact that the work of standardizing is being left, to a great extent, on the hands of the S. A. E., whose committee on electric vehicle standards consists mainly of members of the E. V. A.

Steel Standards for England

Automobile Engineers Establish Ten Standard Specifications As Official

LONDON, May 4—In December, 1914, a meeting was held by the Institution of Automobile Engineers and an invitation was issued to all those interested in the manufacture of steel as far as it concerns automobile engineering. At this meeting a paper was read by L. H. Pomeroy emphasizing, among other things, the need for a reduction in the number of steels then in use in automobile construction and also for a better understanding between automobile engineers and steel makers.

A good deal of interest was aroused among the steel manufacturers and stampers, and the outcome of the meeting was the appointment of a committee consisting of steel manufacturers, drop forgers and automobile engineers. As a result of less than twelve months' labor this committee has suggested a series of ten standard steel specifications for use in automobile construction, and these specifications have now been finally approved by the engineering standards committee of Great Britain and are being issued by that body.

A Paper Read

At the meeting of the Institution of Automobile Engineers held May 10, L. H. Pomeroy, who has acted as chairman of the committee mentioned above, read a paper dealing with these specifications, setting forth the reasons which led to the adoption of the particular steels chosen and specifying the uses to which each of the steels may be put. The British steel specifications will be published in THE AUTOMOBILE as soon as details are available.

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Armored Trucks N. Y. S. A. E. Subject

NEW YORK CITY, May 17—The Armored Motor Truck will be the subject of the evening at a meeting of the Metropolitan Section of the Society of Automobile Engineers to-morrow night in the plant of the International Motor Co., West End Avenue and Sixty-fourth Street, this city. In connection with the meeting several armored cars will be shown and General Wood has appointed Captain Kilbourne of the general staff to represent the army.

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S. A. E. in N. Y. Preparedness Parade

NEW YORY CITY, May 13—The Society of Automobile Engineers in this city was represented in to-day's Preparedness parade, in which over sixty trades and professions took part. The auto-

mobile engineers marched in section 8 of the engineering division of the parade together with the chemical, municipal and aeronautical engineers. The automobile engineers marched in two platoons led respectively by Herbert Chase and Leonard Kebler. This contingent was preceded, as were other contingents, by suitable standards bearing the words "Automobile Engineers." Among those who marched were: J. A. Anglada, A. C. Bergmann, J. R. Cautley, Herbert Chase, C. F. Clarkson, Ferdinand Jehle, Leonard Kebler, N. B. Pope and E. H. Stickles. Other automobile engineers who were assigned to other divisions in the parade were Howard Coffin, Prof. F. R. Hutton, H. M. Swetland, H. C. Wilson, Azel Ames and W. A. Roberts.

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Mid-West Section Meets June 2

NEW YORK CITY, May 15—The second quarterly meeting of the Mid-West Section of the Society of Automobile Engineers will be held June 2 at the Chicago Automobile Club, Chicago, the meeting starting at 8 p. m. W. B. Stout of the Scripps-Booth Co. will present a chalk talk dealing with the relation of art to the automobile, and Henry Farrington of the Jeffery company will give data on motor trucks.

E. B. Blakeley, a mechanical engineer who has been experimenting with small stationary engines which are operated by combustion from compression only, will give a demonstration on how to develop power from any fuel.

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Jewett To Address Detroit S. A. E.

DETROIT, MICH., May 13—D. McCall White, chairman of the Detroit section of the Society of Automobile Engineers, announces that the principal speaker at the next meeting of the section, which is to be held on May 17, will be H. M. Jewett, president of the Paige-Detroit Motor Car Co. Mr. Jewett's topic will be, "What Proportion of His Parts Should the Car Manufacturer Make?" Dealing with a most important phase of modern production, it is expected that a record attendance will be on hand.

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Hambach Is Shakespeare Engineer

KALAMAZOO, MICH., May 12—Ernest Von Hambach, formerly with the Sunderman Safety Carburetor Corp., Newburgh, N. Y., is now in charge of the engineering department of the William Shakespeare Co., manufacturer of carbureters.

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Brown Scripps-Booth Asst. Sales Mgr.

DETROIT, MICH., May 11—W. I. Brown, former supervisor of districts for Dodge Bros., has been appointed assistant sales manager of the Scripps-Booth Co., of which W. B. Stout was recently made sales manager.

Webber a Maxwell Vice-Pres.

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6500 Cars a Month Being Built —Year's Output Is Estimated at Over 65,000

DETROIT, MICH., May 10—Orlando F. Webber, assistant general manager of the Maxwell Motor Co., has been elected a vice-president of the company in addition to retaining his previous connection. Mr. Webber has been a figure in the automobile industry since its inception and joined the Maxwell organization in April of last year.

The Maxwell company has declared its regular dividend of 1¾ per cent on the first preferred stock, but no action has been taken on the second preferred. Manufacture of Maxwells is running at the rate of about 6500 cars per month at the present time, and it is estimated that the production for the current fiscal year will be between 65,000 and 75,000 cars, as compared with 32,000 last year. About 300 cars per day are being turned out. Some $250,000 worth of improvements have been completed at the Detroit plants and an equal amount of money is to be spent at Newcastle, Ind., this fall. Sales are said to be running ahead of expectations, with dealers demanding about 15,000 more machines than they thought they would require when the schedules were made up last July. It is stated that about $5,000,000 will be earned this fiscal year, which closes July 31. This is sufficient for regular dividends upon the two preferred stock issues and about 27 per cent on the common.

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30 per Cent of Military Cars in France Always Under Repair

PARIS, April 28—More than 30 per cent of the touring cars employed on military work are always under repair, according to a statement made by the Military Governor of Paris. This percentage, which is considerably higher than in any civilian service, is accounted for by the strenuous nature of military service, unnecessarily hard driving, and lack of attention. As a remedy, the authorities have ordered that all drivers shall be allowed a minimum of half a day each week to thoroughly clean, examine and execute minor repairs to their cars. In addition, officers must insist on cars being washed every day, and allow time for this work. It is forbidden for cars to operate away from macadamized or paved roads. When officers have to reach posts situated across country, they must go by car to the limit of the made roads and complete the journey on foot. The average speed on made roads must be kept down to 18 miles an hour. It is difficult to believe that this speed restriction will be observed on long trips over well made and uncongested roads. At suitable intervals all cars must be sent to the workshop to be examined and put in order. This must be done even if no other car is available as a replacement: it is better that the officers should be without a car for half a day rather than allow defects to accumulate until the vehicle is irreparable.

A Service Book Used

When cars are on detached service the officers using them are given a service book, on presentation of which at any army depot they are able to get supplies and repairs. This book constitutes a record of all work done on the car and enables cases of neglect to be traced to the responsible party. Officers on isolated service having the use of an automobile are under an obligation to keep the captain of the group to which the car belongs constantly informed as to the place in which it is garaged, thus allowing him to inspect it at intervals. This will prevent any officer using a car until it is ruined and then returning it to the group for a new machine.

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Taylor with Allen Pressure Co.

NEW YORK CITY, May 16—H. W. Taylor, former general manager of the General Motors Co., has become general manager of the Allen Pressure System Co., this city. His headquarters will be at the offices of the company at 1926 Broadway.

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McCutchen President Ross Co.

DETROIT, MICH., May 13—C. G. McCutchen, formerly president of the American Gear & Mfg. Co., Jackson, has been elected president of the Ross & Young Machine Co. Mr. Ross, who has been identified with the automobile industry for the last twelve years, will devote his efforts to the furtherance of the business of the Ross Automobile Co.

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Skiles, Ohio Tube Co. Head, Dies

SHELBY, OHIO, May 11—G. M. Skiles, president of the Ohio Seamless Tube Co., this city, died in this city on May 4. He was one of the original owners and incorporators of the tube works. In 1908, when the plant was purchased from the United States Steel Corp., Mr. Skiles was instrumental in forming a new company, and selling the stock in the institution.

He was born at Stowstown, Pa., Feb. 25, 1852.

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Individual Tractor Tests Tabooed

NEW YORK CITY, May 18—The National Tractor Manufacturers' Assn., of which J. B. Bartholomew of the Avery Co., Peoria, Ill., is president, has decided that individual non-competitive plowing

demonstrations do not come within the province of its committee for demonstrations. This information is imparted in a resolution which was adopted late last month. The resolution follows:

Resolved: That the association approve and ratify the action of the committee on tractor demonstrations in the selection of places, dates and circuit, and its refusal to sanction or attend other demonstrations;

That the association holds that individual non-competitive plowing demonstrations do not come within the province of the committee;

That we will make no tractor plowing demonstrations at any County, District or State Fair in the United States, except each manufacturer may exhibit in the County Fair in the county where its factory is located;

That where competitive demonstrations are not under the auspices of the committee and made by individual purchasers, no member of the association will bear any part of the expense of, or have any salesman or expert at, any such demonstration.

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Morehouse with Redden Truck

DETROIT, MICH., May 13—Jay E. Morehouse, who was special sales representative of the Maxwell Motor Co., and formerly general sales manager of the H. A. L. company, Cleveland, has been appointed sales manager of the Redden Motor Truck Co., with headquarters at 676 Woodward Avenue. The Redden company builds the Redden Truck-Maker, an attachment for the Ford chassis.

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Two Assistants for Hawley

DETROIT, MICH., May 11—The Puritan Machine Co. recently appointed G. Jacob and R. V. Burrell as assistants to E. W. Hawley, service manager. These appointments were necessitated on account of the extraordinary growth in the service department of the company, due to the acquisition of orphan car companies.

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Mendel Is Rex Ignition Manager

NEW YORK CITY, May 16—E. H. Mendel, formerly on the staff of the Splitdorf Electrical Co., has joined the Rex Ignition Mfg. Co. in the capacity of general manager. Mr. Mendel's headquarters will be in the New York office at Fifty-eighth Street and Eighth Avenue.

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Fox Joins Wetmore-Quinn Co.

DETROIT, MICH., May 13—C. S. Fox, formerly director of service for the old Lozier Motor Co., has formed a connection with the Wetmore-Quinn Co., Detroit distributors for Paige-Detroit and Saxon cars.

Studebaker Boosts Production

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16,952 Cars Sold in Quarter Ending March 31— 5700 Dealers

DETROIT, MICH., May 13—Although the Studebaker Corp. established a new production record for the first quarter of this year, it is said that the present three months are certain to far surpass the previous period from the standpoint of production and sale of cars.

Sales of Studebaker cars for the first quarter ending March 31 were 16,952 machines, as compared with 9400 for the same period the previous year, an increase of 75 per cent, and this will be greatly outdone this quarter. The completion of the new $1,000,000 factory extensions will be a considerable factor in enabling the Studebaker concern to increase its output for the present quarter, and the easing up of the freight situation is expected to make it possible to ship all the cars that can be built.

With the largest selling organization in its history, numbering 5700 dealers, the problem of distributing this year's output will not assume any great difficulty.

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Studebaker Corp. of Canada Formed

OTTAWA, ONT., May 16—The Studebaker Corp. of Canada has been incorporated here with a capital of $400,000.

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Standard Steel Car Starts Building

PITTSBURGH, PA., May 15—The Standard Steel Car Co., this city, has broken ground for a new plant which will be over ½ mile long and 60 ft. wide. This is to be the assembly department and is to be without a single inside post or pillar through its whole length.

One of the buildings, heretofore used in another line of manufacture, has been transferred to the automobile department for the manufacture of axles. Contracts have also been let for two additional buildings, one of which is 280 ft. long and 60 ft. wide and four stories high, while the other is 320 ft. long, 60 ft. wide and two stories high.

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Jeffery to Add Two Buildings

KENOSHA, WIS., May 13—The Thomas B. Jeffery Co., this city, will add two shop buildings to its plant at Kenosha, Wis., this summer. Plans for the new structures are being rushed to completion by a firm of Chicago architects. Work will be started first on a new foundry. This building will measure 125 by 600 ft., will be one story high and of reinforced concrete. The roof of the building will be so constructed as to make smoke and gases a negligible quantity inside. It will be built saw-tooth style, with the windows so arranged as to open automatically at intervals.

The other building planned by the Jeffery company will be five stories high and of concrete. It will be devoted exclusively to the manufacture of car bodies and will contain modern kilns for seasoning the lumber used. Jeffery manufactures its own bodies. The Jeffery company has 3080 men on its payroll, and this force will be increased soon. At present the Jeffery plant occupies 101 acres, of which 26 acres are under roof.

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Grant Awards Plant Contract

CLEVELAND, OHIO, May 16—The general contract for the first factory unit of the new plant of the Grant Motor Car Co. to be erected in this city on a tract purchased last week was awarded yesterday to the Walther Engineering Co. The site, which is located at Colt and Kirby roads, is seven acres in area. The plans for the new factory structure, which were filled at the city hall yesterday, are by the W. S. Ferguson Co. Its estimated cost is $135,000.

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Packard Acquires Krit Plant

DETROIT, MICH., May 12—The Packard Motor Car Co. has acquired the plant formerly occupied by the Krit Motor Car Co., which adjoins the Packard property on East Grand Boulevard. This plant has been vacant since the Krit concern failed some time ago, and the ground has a frontage of 300 ft. with a depth of 600 ft. The factory buildings are three- and two-story structures of brick. Packard has made no decision as to what it will do with the property, but will probably be used for future expansion.

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Standard Tube on Eight-Hour Schedule

TOLEDO, OHIO, May 12—The Standard Steel Tube Co. has reduced its working hours to eight per day, and has raised the wages of its 400 employees 20 per cent over what they are now receiving, this to take effect to-day. During the summer months the men will work forty-five hours per week, and beginning Sept. 1 and continuing through the fall and winter months, the total week's work will consist of forty-eight hours.

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U. S. L. Make Additions to Plant

NEW YORK CITY, May 15—The United States Light & Heat Corp. will produce in the next twelve months considerably over 300,000 U. S. L. batteries. Additions are now being made to its plant at Niagara Falls to take care of this increased demand.

A Body Plant for Detroit

Springfield Body Co. Buys 29 Acres and Will Erect a Factory

DETROIT, MICH., May 12—The Springfield Body Corp., at present located at Springfield, Mass., and manufacturer of convertible bodies, is soon to have a factory here. To-day a 29-acre tract of land was secured on Michigan Avenue, in the Springwells district of the city, and convenient to railroad lines. A modern fireproof factory is to be begun immediately, although details of the structure are not yet available.

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Reo Buys 7 Acres More

LANSING, MICH., May 13—As an indication of the buildings and extension activities which the Reo Motor Car Co. has in contemplation, additional property has been acquired along the Grand Trunk railroad tracks adjacent to the Reo concern's main plants here. The tract is 7 acres in extent, and will provide room for greatly enlarged facilities, although no announcement as to what disposition will be made of the new property has yet been given out. This is the second large block of land that Reo has acquired within the last few months here.

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8-Hr. Day for Garford Employees

ELYRIA, OHIO, May 13—Eight hundred employees of the Garford Mfg. Co., this city, went on an 8-hr. day schedule May 11, instead of the previous 10-hr. schedule. It is announced that time and a quarter will be paid for the ninth hour, time and a half for the tenth hour and double time over the former regular day's schedule. Employees working on piece work will receive a raise equivalent to 7½ per cent.

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To Reopen Republic Rubber Plant

YOUNGSTOWN, OHIO, May 11—T. L. Robinson, president of the Republic Rubber Co., Youngstown, makes the announcement that the plant will be reopened in a few days. The plant was closed down about two weeks ago by labor troubles. He claims that many of the employees are anxious to return to work. State mediators are trying to settle the differences.

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Monroe Buys Land in Pontiac

PONTIAC, MICH., May 13—In line with its proposed expansion, the Monroe Motor Co., at present located in Flint, but which will soon move to this city and occupy the factory buildings formerly used by the old Welch company, has purchased a plot of land having a 596-ft. frontage on Saginaw Street adjoining the former Welch plant property. This purchase will enable the Monroe company to put in sidetracks to its property from the D. G. H. & M. tracks at Foote Street and will provide for any later additions to plant.

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Continental Buys 7 Acres

MUSKEGON, MICH., May 12—With a view to future expansion, the Continental Motors Co. has increased its real estate holdings here by buying a 7-acre tract on the lake front, which land is at present occupied by a lumber and fuel firm. This new land will give Continental plenty of room to spread out for some years to come.

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Fisk Grants 8-Hr. Day

CHICOPEE FALLS, MASS., May 13—The employees of the Fisk Rubber Co. have been granted an eight-hour day with five hours on Saturday. Time and a half will be given for overtime work. This comes as a result of a strike, started in March. The strikers will meet in the near future to decide on the company's proposition.

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Hupp Joins Emerson Motors

DETROIT, MICH., May 12—R. C. Hupp, who organized the original Hupp Motor Car Co., and later left it to head the R-C-H-Corp., and after the latter's failure organized the Monarch Motor Car Co., has become identified with the Emerson Motors Co., a Delaware corporation which proposes to manufacture a five-passenger car to sell at about $395. This concern will be located in the East.

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Komp Elected Lansden President

NEW YORK CITY, May 15—F. S. Komp, formerly secretary and purchasing agent of the Lansden Co., this city, has been elected president and treasurer of the company, succeeding A. G. McLaughlin. W. R. Garton becomes vice-president and general sales manager and N. A. Burgess, secretary. Mr. Garton is also sales engineer, with offices at 299 Broadway, this city.

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Somerville with Republic Truck

ALMA, MICH., May 16—W. A. Somerville, who for some years was advertising manager of the Rapid Motor Truck Co., Pontiac, Mich., and who later held a like position with the Stromberg Motor Devices Co., Chicago, Ill., has been appointed advertising manager of the Republic Motor Truck Co.

M. & W. Co. Plans Concentration

Buys Tract of Land 500x400 Ft. Adjoining Present Plant

DETROIT, MICH., May 12—Morgan & Wright, subsidiary of the United States Rubber Co., and large manufacturer of automobile tires, has taken a step looking to the concentration of the tire making operations of the concern here by the acquisition of a block of land on Jefferson Avenue with a frontage of 500 ft. and depth of 400 ft. This adjoins the present large factories of Morgan & Wright and was bought from the Michigan Steel Boat Co., whose factory buildings now occupy the site. The purchase price is not known, but real estate men here state that it has a value of $350,000. The tire manufacturing concern does not take possession of the property until January, 1917, by which time the boat manufacturer will have completed another plant.

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Leather Firms in $1,500,000 Merger

NEWARK, N. J., May 11—Two of the oldest patent leather companies in this city have merged into the General Leather Co., with a capital of $1,500,000, to manufacture automobile and carriage leather. The concerns merged are E. S. Ward & Co., and the Hugh Smith Co. A large plant will be erected, starting next week, adjoining the Ward plant, and when finished, will employ 500 persons.

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To Split Up Overland Shares

TOLEDO, OHIO, May 16—The Willys-Overland Co., this city, will shortly split up the common stock into shares of $25 par value, as reported in a previous issue of THE AUTOMOBILE. This will mean that instead of 210,000 shares of $100 par value, there will be outstanding 840,000 shares. According to information given out, the Secretary of State of Ohio has granted the company's application for the procedure, and the change will be made before July 1. The chief purpose of the quadrupling of the number of shares, without disturbing the amount of capital, will be to bring about a greater elasticity in the market for Overland stock.

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Moreland Double Shift a Success

LOS ANGELES, CAL., May 12—The double shift system recently inaugurated at the Moreland Motor Truck Co. of this city in the machine and service departments is proving a great success, and the system is soon to be adopted throughout the entire factory.

7417 Cars and Trucks Exported in March—Valued at $8,636,118

Value of 1878 Trucks Totaled $4,909,179, While the 5539 Passenger Cars Were Worth $3,726,939—Gain of 539 Trucks and 3110 Passenger Cars

WASHINGTON, D. C., May 12—The popularity of American-built cars and trucks is growing all the time in foreign climes, as the latest government statistics vividly show. During the month of March last, according to figures compiled by the Bureau of Statistics, 1878 commercial cars, valued at $4,909,179, were shipped abroad, as against 1339 commercial cars, valued at $4,725,563, exported during the corresponding month of last year. The exports of passenger cars increased from 2429 cars, valued at $1,958,302, in March, 1915, to 5539 cars, valued at $3,726,939, in March last, while the exports of parts, not including engines and tires, increased from $762,386 to $1,858,247 during the same periods.

The figures for the nine months' period ended March show astounding increases in exports. It will amaze many to learn that during the nine months ended March, 1916, there were 38,795 passenger cars, valued at $29,261,446, exported to all parts of the globe, while during the same period of last year the exports totaled 11,563 cars, valued at $9,551,731. Exports of commercial cars also show a remarkable gain from 6313 cars, valued at $18,737,487, during the nine months ended March, 1915, to 16,345 cars, valued at $43,638,900, during the corresponding period of 1916. During these periods the exports of parts, not including engines and tires, rose in value from $4,116,608 to $16,823,607.

It is interesting to trace the different parts of the world to which these tremendous shipments of automobiles went during the periods under consideration. Of course, the warring nations in Europe are importing thousands of cars, but other sections of the world are also beginning to buy American-built cars at a rate that must be pleasing to every manufacturer who is looking into the foreign field.

Looking over the statistics, one finds that France imported 948 cars, valued at $2,405,437, from this country in March last, as against 460 cars, valued at $1,918,053, imported during the same month of last year. During the nine months' period these exports increased from 2896 cars, valued at $8,325,140, in 1915 to 5147 cars, valued at $13,203,663, in 1916.

The exports of cars to the United Kingdom fell off in March last as compared with the exports for the same month of last year, but during the nine months' period there was a big gain. In March a year ago 1566 cars, valued at $2,468,014, were exported to King George's islands, while in March last the number was 1367 and the value $1,711,672. During the nine months of 1916 no less than 16,107 cars, valued at $22,089,418, were shipped there, as against 6197 cars, valued at $8,915,029, exported during the same period of 1915.

Russia Buys More Cars

Russia, which is just beginning to figure in the export returns, bought twenty-eight cars, valued at $95,753, from this country in March last, while during the nine months ended March last the Czar's realm's purchases totaled 4596 cars, valued at $14,434,529. There are no figures for the comparative periods.

There were no exports of cars to Germany during any of the periods under consideration.

Denmark, in March last, came to the front with purchases of fifty-five cars, valued at $41,351, while during the nine months of 1916 the number was 524 and the value $356,256.

Forty-five cars, valued at $23,514, was the extent of Italy's importations from this country in March last, which is a considerable gain over the figures for the same month of last year, when the importations were twenty-three cars, valued at $13,273. A much larger gain is indicated in the nine months' figures, the exportations of cars increasing from sixty-five cars, valued at $48,385, in 1915 to 252 cars, valued at $169,658, in 1916.

The exportations of cars to countries designated as "other Europe" amounted to 410 cars, valued at $361,144, in March last, as compared with 431 cars, valued at $1,293,577, in March a year ago. During the nine months' period these exports fell from 1263 cars, valued at $3,594,223, in 1915 to 1350 cars, valued at $1,336,154, in 1916.

Canada's Big Gain

Canada bought 1016 American cars, valued at $751,457, in March last, while during the nine months' period of 1916 the purchases amounted to 5303 machines, the value of which was $3,785,265. This is a big increase over the figures for the same periods of last year, which were 345 cars, valued at $317,516, and 2072 cars, valued at $2,553,942.

South America continues to loom up strong as a buyer of American-built cars.

Exports of Automobiles, Trucks and Parts for March and 9 Previous Months

	March				Nine Months Ending March			
	1915		1916		1915		1916	
	Number	Value	Number	Value	Number	Value	Number	Value
Passenger cars	2,429	$1,958,302	5,539	$3,726,939	11,563	$9,551,731	38,795	$29,261,446
Commercial cars	1,339	4,725,563	1,878	4,909,179	6,313	18,737,487	16,345	43,638,900
Parts, not including engines and tires	.....	762,386	.....	1,858,247	.....	4,116,608	.....	16,823,607
	3,768	$7,446,251	7,417	$10,494,365	17,876	$32,405,826	55,140	$89,723,953
By Countries								
Denmark	.....	.....	55	$41,351	.....	.....	524	$356,256
France	460	$1,918,053	948	2,405,437	2,896	$8,325,140	5,147	13,203,663
Germany	4	2,800	.....	.....	20	20,164	.....	.....
Italy	23	13,273	45	23,514	65	48,385	252	169,658
Russia	.....	.....	28	95,753	.....	.....	4,596	14,434,529
United Kingdom	1,566	2,468,014	1,367	1,711,672	6,197	8,915,029	16,107	22,089,418
Other Europe	431	1,293,577	410	361,144	1,263	3,594,223	1,350	1,336,154
Canada	345	317,516	1,016	751,457	2,072	2,553,942	5,303	3,785,265
Mexico	9	4,861	65	45,895	58	59,635	291	284,421
West Indies and Bermuda	223	136,675	654	360,835	874	576,317	3,362	2,072,919
South America	205	96,599	.....	.....	808	434,051	.....	.....
Argentina	.....	.....	357	185,099	.....	.....	2,992	1,384,959
Brazil	.....	.....	40	25,408	.....	.....	184	114,929
Chile	.....	.....	39	27,352	.....	.....	579	400,741
Venezuela	.....	.....	68	41,567	.....	.....	369	239,752
Other South America	.....	.....	81	44,799	.....	.....	413	234,869
British East Indies	.....	.....	267	205,795	.....	.....	2,126	1,606,196
British Oceania	284	252,212	785	648,529	2,164	1,788,803	4,790	4,052,446
Asia and other Oceania	132	115,366	706	1,313,160	946	1,559,043	3,997	5,180,887
Other countries	86	64,919	486	347,351	513	414,486	2,758	1,953,284
	3,768	$6,683,865	7,417	$8,636,118	17,876	$28,289,218	55,140	$72,900,346

Here are some of the telling figures: Argentina bought 357 cars, valued at $185,099, in March last, and during the nine months' period of 1916 the purchases amounted to 2992 cars, valued at $1,384,959. Brazil imported forty cars in March, the value of which was $25,408; during the nine months the importations amounted to 184 cars, valued at $114,929. Chile took thirty-nine cars in March, valued at $27,352, and 579 cars, valued at $400,741, during the nine months, while Venezuela bought sixty-eight cars, valued at $41,567, in March and 369 cars, valued at $239,752, during the nine months. "Other South America" imported eighty-one cars, valued at $44,799, in March last, as against 205 cars, valued at $96,599, for all of South America in March a year ago. Under this same heading 413 cars, valued at $234,869, were shipped during the nine months of 1916, as against 808 cars, valued at $434,051, for the whole of South America during this period last year.

Tremendous gains have also been made in the exports of cars to British East Indies, British Oceania, West Indies and Bermuda, and "other Asia and Oceania."

The accompanying table shows the detailed figures for the periods under consideration.

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Pennsylvania Vacuum Cup and Ebony Tread Prices Reduced

NEW YORK CITY, May 13—The Pennsylvania Rubber Co., Jeannette, Pa., has made public a reduced list on its Vacuum Cup and Ebony Tread tires effective May 15, stating that this is made possible by improved manufacturing methods available in its new plant and by increased production. The reduction, however, is not general with other tire companies, none of them expecting a reduction. To the contrary, several of them predict a rise in the near future in view of the higher cost of raw material. This is offset in part by the statement from another large concern that changes of any nature are not likely until Sept. 1.

The old and new prices of the Pennsylvania company follow:

Size	Vacuum Cup Old	Vacuum Cup New	Ebony Tread Old	Ebony Tread New
30 x 3	$16.60	$14.20	$12.45	$12.05
30 x 3½	21.05	18.75	17.65	15.65
32 x 3½	24.05	20.75	19.15	17.65
33 x 4	33.75	29.25	25.45	24.80
34 x 4	34.85	30.30	26.30	25.75
36 x 4½	48.95	43.40	36.95	36.90
37 x 5	58.30	52.75	46.95	44.80

The Vacuum Cup style is guaranteed for 6000 miles and the Ebony Tread style for 5000 miles. Prices of tubes remain unchanged.

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Overland's Wage Schedule in Effect

TOLEDO, OHIO, May 13—The 20 per cent increase in wages and the 8-hr. day schedule at the plant of the Willys-Overland Co. became effective May 11. Nearly 18,000 factory employees are affected and $25,000 is added to the weekly payroll.

Abandon Gasoline Tax Idea

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Munitions, Inheritance and Heavier Income Taxes Proposed

WASHINGTON, D. C., May 13—Following a conference between Secretary of the Treasury McAdoo, financial adviser of President Wilson, and Congressman Claude Kitchin, Democratic floor leader of the House, it was learned that a complete abandonment of the President's proposal to tax gasoline and other articles used in industry to raise money for preparedness was decided upon. The President himself has changed on this portion of his message to Congress and favors instead a munitions, inheritance and heavier income tax. Kitchin is reported to have told Secretary McAdoo he was pleased the President had decided to abandon the gasoline tax, as rural congressmen in particular are opposed to it.

It is reliably reported that the Federal Trade Commission will on June 1 make its report in connection with the investigation it has been making into the boosts in the price of gasoline. It is stated that the report will fix the responsibility for the increases.

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Acme Wagon Builds Trucks

EMIGSVILLE, PA., May 12—A new commercial car has been placed on the market by the Acme Wagon Co., this city. At present the Emigsville plant is turning out the trucks in two sizes, ¾- and 1-ton capacities. The ¾-ton truck is equipped with a Wisconsin motor, Timken roller bearings, worm drive axle and heavy pneumatic tires. The 1-ton truck has a Continental motor, heavy-duty internal gear drive axle and solid rubber tires.

Both trucks have wide frames which bring the springs close to the wheels on the axle, reducing side sway and vibration and at the same time making it strong and durable. The bodies for the trucks will be made up special as to size and style to suit the purchaser and for the purposes intended. E. K. Emig is the president of the company.

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Packard Gets Big Truck Order

DETROIT, MICH., May 15—The Packard Motor Car Co. made a record in filling an order for fifty-six 3-ton army trucks, received from the War Department at 3 p. m. Sunday. Immediately all available men were pressed into service, and by 7 p. m. the trucks were loaded on cars and only awaited final shipping instructions in order to be on their way to Fort Sam Houston at San Antonio, Tex. The order called for the fitting of the regulation army transfer bodies and painting them the standard olive drab that characterizes all army equipment of the kind. The Packard company had anticipated the order to the extent of having made a number of the bodies in advance, so that the trucks left Detroit with only the paint wet.

The Government pays Packard $186,425 for these trucks, and this is the third order received. Included in the order was a requirement that eighty-two able-bodied men be furnished. The trucks required two special trains, and on each train there must be one truckmaster, three assistants, one expert mechanic, one assistant mechanic, thirty-three drivers and two cooks. On reaching Fort Sam Houston all will be enlisted in the army.

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Manufacturers Plan Employers' Union

NEW YORK CITY, May 17—One of the points brought out at the convention of the National Assn. of Manufacturers in session yesterday at the Hotel Astor, was the need of an association of all American employers of labor to represent capital and dealings with the American Federation of Labor. The great idea in this project is to reach a solution of the ever-recurring quarrels between capital and labor interests. The plan is at present only vaguely outlined, but includes a central bureau in which statistics and data on strikes and similar industrial matters will be maintained and which will employ experts in the study of industrial legislation.

The association also considered means of credit for foreign business and went on record in favor of the draft acceptance system as opposed to the open account.

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Packard Prepares Aviation Field

DETROIT, MICH., May 16—Following the recent tests on the Sheepshead Bay track of the smaller of the new aeroplane motors developed by the Packard Motor Car Co., it is of interest to note that before long Packard will be able to test its aircraft motors on its own aviation field near Mt. Clemens, Mich. Work of removing trees, filling in low places, in general, grading and smoothing the field, is well under way. Practical tests of the first large aircraft motor manufactured by Packard, which, by the way, is considerably larger and more powerful than the one which was tested in a car at Sheepshead Bay, will take place early in July. These tests will be made with a Sloane aeroplane of the tractor type. The larger motor is said to develop 300 hp., has approximately 900 cu. in. piston displacement and is built exactly like the smaller motor, except on a larger scale.

Overland Sales Gain 174% for Year

Willys Re-Elected President—Other Officers Re-elected —900 Cars a Day

TOLEDO, OHIO, May 12—The regular annual meeting of the stockholders of the Willys-Overland Co. was held here recently, in conformity with the new by-laws adopted last fall which changed the fiscal year from closing June 30 to Dec. 31. Hereafter the annual meeting will be held the second Tuesday in May.

At this meeting all of the old officers were re-elected. John N. Willys was re-elected as president; H. T. Dunn, vice-president; H. L. Shepler, vice-president; Isaac Kinsey, vice-president; C. A. Earl, vice-president; Walter Stewart, treasurer, Royal R. Scott, secretary. The board of directors consists of these officials and James Kepperly and Rathbun Fuller.

One of the interesting features of the meeting was the report that Overland shipments for the twelve months ending April 30, this year, were 137,665 cars, as compared with 50,258 cars for the preceding year, an increase of 174 per cent. The largest single month of the twelve prior to April 30, 1916, was that in which 19,781 cars were shipped, as against 7005 for the largest month of the previous year.

But even with this striking increase, the Willys-Overland Co. had on hand May 1 orders for 11,301 cars, as compared with 4527 on order on May 1, 1915. The foreign business, in spite of the war, also has shown a great jump over a year ago. Total exports, all models, for the 1915 season were 2331 cars, whereas, up to May 1 this year, export sales totaled 9867 cars, with unfilled orders for 977 more. Had it not been for a lack of ocean shipping facilities, it is thought that this total could readily have been increased approximately 2000 more.

It is said that shipments are now averaging close to 900 cars a day, and that when the last of the new buildings now under construction is completed the output will be raised to 1000 cars daily.

The latest unit of the Overland group is a 500,000 sq. ft. structure that has just been completed. The building, known as No. 49, is five stories high and built of reinforced concrete throughout, and is one of the largest of the many Overland structures. The entire amount of space will be given over to the manufacture of closed cars, a branch of the business that has surprised the officials by its growth. The first and second floors will be used for final testing, the third for parts assembly, the fourth for painting and trimming of closed cars and the fifth for the making of tops and trimming. Seven hundred power sewing machines are installed here, and this is the only department, outside of the administration offices, where women will be employed. Some 800 will be at work in this department.

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L. O. Gordon Mfg. Co. Formed

MUSKEGON, MICH., May 13—The L. O. Gordon Mfg. Co. has been organized here by J. V. Whitbeck, chief engineer of the Chandler Motor Car Co., Cleveland; C. A. Carey, purchasing agent of the same company, and L. O. Gordon, formerly engineer for the Muskegon Motor Specialties Co. The new concern intends to make camshafts and other motor specialties, and will have an employed force of 100. The city of Muskegon is to erect a $10,000 plant, 46 by 177 ft., for the new concern, and it is expected that deliveries will start on Sept. 1.

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Thelma Motor Co. Reorganized

ECORSE, MICH., May 10—The Thelma Motor Co. has been reorganized, the capital increased, and the name of the firm changed to the Robinson Machine Co., which company will engage in the manufacture of motor parts. Al. Robinson will remain as president and manager of the new company. The manufacture of Thelma marine motors has practically been discontinued.

Daily Market Reports for the Past Week

Material	Tues.	Wed.	Thur.	Fri.	Sat.	Mon.	Week's Ch'ge
Aluminum	.58	.58	.58	.58	.58	.58	...
Antimony	.36½	.36½	.35½	.34½	.34½	.34½	—.02
Beams and Channels, 100 lb.	2.77	2.77	2.77	2.77	2.77	2.77	...
Bessemer Steel, ton	45.00	45.00	45.00	45.00	45.00	45.00	...
Copper, Elec., lb.	.29½	.30	.30	.30	.30	.30	+.00½
Copper, Lake, lb.	.29½	.30	.30	.30	.30	.30	+.00½
Cottonseed Oil, bbl.	10.95	10.90	10.86	10.75	10.85	10.83	—.12
Fish Oil, Menhaden, Brown	.54	.55	.55	.55	.55	.55	...
Gasoline, Auto, bbl.	.24	.24	.24	.24	.24	.24	...
Lard Oil, prime	1.10	1.10	1.10	1.10	1.10	1.10	...
Lead, 100 lb.	7.40	7.40	7.30	7.50	7.50	7.50	+ .10
Linseed Oil	.74	.74	.74	.73	.73	.73	— .01
Open-Hearth Steel, ton	45.00	45.00	45.00	45.00	45.00	45.00	...
Petroleum, bbl., Kan., crude	1.55	1.55	1.55	1.55	1.55	1.55	...
Petroleum, bbl., Pa., crude	2.60	2.60	2.60	2.60	2.60	2.60	...
Rapeseed Oil, refined	1.10	1.10	1.10	1.10	1.10	1.10	...
Rubber, Fine Up-River, Para	.69	.70	.71½	.71½	.71½	.71	+ .02
Rubber, Ceylon, First Latex	.73	.72½	.75	.75	.75	.71	— .02
Sulphuric Acid, 60 Baume	3.00	3.00	3.00	3.00	3.00	3.00	...
Tin, 100 lb.	49.88	49.38	49.00	49.13	49.13	49.00	— .88
Tire Scrap	.05¾	.05¾	.05¾	.05¾	.05¾	.05¾	...

Corcoran-Victor Co. Formed

Cincinnati Lamp Cos., Merger Completed—Capital To Be $2,250,000

CINCINNATI, OHIO, May 13—The Corcoran-Victor Co., has been formed with a capital of $2,250,000, thus completing the merger outlined in THE AUTOMOBILE for April 16.

The merged companies will be under a single management and the new company will include the Corcoran Lamp Co., the Victor Lamp Co., and the Victor Auto Parts Co., all of this city. The stock of the new company consists of $750,000 preferred, of which $200,000 is retained in the treasury, and $1,500,000 common, some of which will be offered to the public. The five Corcoran brothers, T. J., who owned the Corcoran Lamp Co.; W. J. and E. B., who owned the Victor Lamp Co.; and J. L. and H. R., who owned the Victor Auto Parts Co., were paid in cash and stock in the new company.

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Copper Prices Half Cent Higher

NEW YORK CITY, May 16—Electrolytic and lake copper went up ½ cent a pound to 30 cents last Wednesday. This market holds very firm, with an active domestic and foreign demand. Lead reached $7.50 per 100 lb., a 10-cent gain, while antimony dropped 2 cents to 34½ cents a pound. Rubber is still being maintained at a low level, both Para and Ceylon grades quoting at 71 cents a pound yesterday. Tin fluctuated this week, closing yesterday at $49 per 100 lb., a loss of 88 cents for the week.

Cottonseed oil dropped to $10.83 per barrel, at a loss of 12 cents, and linseed oil closed with a loss of 1 cent, the quotation being 73. The rest of the oils and lubricants and metals remained constant and steady.

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Gasoline Prices Remain Unchanged—Another Fuel Substitute Announced

NEW YORK CITY, May 15—Gasoline prices along the Atlantic Coast remained unchanged last week. It is expected that the present quotations will stay at this level for some time. Sentiment in the trade indicates that crude oil quotations have about reached their highest level, although the belief that a decline is due has not gained any wide support. Oil interests expressed the opinion that the new production should prevent any further advances for some time to come, as they believe that the rise has been sufficient to cover growing consumption in large measure. It is recognized that the price of gasoline may rise, although crude quotations remain stationary, but

it is said that until the price of crude goes up, the advance in gasoline will not be of large proportions.

Last month saw a decrease in new oil producing wells, the record for that month showing 94,938 barrels as against 152,020 in March. Wells to the number of 1580 were brought in as compared with 1383 in March.

One more fuel substitute has been announced, this one coming from Bloomfield, N. J. This is a white liquid and F. R. Blamey, a grain merchant, is the inventor. Mr. Blamey states that a teaspoonful of this liquid in 5 gal. of mixed kerosene and gasoline will form a practical fuel costing less than gasoline.

Out in Detroit the Reichenbach Laboratories Corp. has been formed with Lee Olwell, G. W. Durham, H. M. Reichenbach, Paul Weadock and H. D. Van Norman as directors. This corporation controls the Reichenbach patents for an automobile fuel system by reatomizing liquid fuel so that none reaches the cylinders in that form. It is said that a saving of some 50 per cent has been effected under test.

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Demurrage of $5 a Car on New Haven

NEW YORK CITY, May 11—The New Haven Railroad has filed a new tariff with the Interstate Commerce Commission to be effective May 25, providing for a demurrage charge of $5 a car a day. This charge will be additional to the usual demurrage. This high fee has been deemed necessary because of the continued delay on the part of recipients of freight in taking their consignments from the cars.

Motor Stocks Show Strength

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Overland and Chevrolet Reach New High Records—New Departure Up 27 Points

NEW YORK CITY, May 16—Exceptional strength and new high records featured the automobile and accessory securities on the local stock exchange last week. Expectation of large dividends and the healthy tone of the market were responsible for large gains in which Overland, General Motors, Chevrolet, Studebaker and New Departure figured prominently. New high records were made by Overland and Chevrolet. Overland rose to 270 on Saturday, going up 10 points for the day. The previous record was 268 last November. Overland stock has risen 30 points in three days. Chevrolet on Monday advanced to 228, a new high record. Studebaker common went up 8½ points to 141. Reports have it that Studebaker, during the first quarter of 1916, exclusive of its war order business, showed net income of approximately $2,500,000. New Departure rose to 217, a gain of 27 points, on the announcement that it was to be merged with four other accessory and parts makers into the United Motors Corp.

The United Motors Corp. stock, which was introduced to trading for the first time yesterday, sold at prices ranging from 66 to 74. It closed at 68½. According to Street reports, the stock was underwritten around 55.

General Motors showed considerable strength at 460, a gain of 35 points for the week and 9 points for the day. Apropos of the Studebaker common, sales for the day amounted to 16,000 shares. Maxwell common and first preferred each made good gains for the week, the first going up 3½ points and the latter 3½. Some disappointment was expressed in Wall Street circles over the failure of the directors of this company to declare a dividend on the second preferred stock at its meeting last Tuesday. Earnings of the company, it is stated, are running at the rate of approximately $5,000,000 net for the twelve months. On this basis the company is expected to show between 27 and 29 per cent earned on its outstanding common stock for the fiscal period.

On the Detroit Exchange Paige-Detroit, with its 175-point gain, was the feature. This company last week proposed declaring an 80-per cent dividend on its stock and also doubling its stock.

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Alliance Tire Supt. Made Director

ALLIANCE, OHIO, May 12—W. H. Christensen, superintendent for the Alliance Rubber Co., this city, has been elected to the board of directors to fill the vacancy caused by the death of the late George C. Russell, who died in California, March 30. J. C. Shively succeeds Mr. Russell as president of the company. Milton Bejach is vice-president and general manager. The statement submitted to the directors and stockholders as of April 1 shows a 1500-per cent increase in business over the corresponding period of 1915. Tires and inner tubes are the chief lines of manufacture.

Automobile Securities Quotations on the New York and Detroit Exchanges

	1915 Bid	1915 Asked	1916 Bid	1916 Asked	Wk's Ch'ge
Ajax Rubber Co. (new)	..	..	66	67½	+1
Aluminum Castings pfd	98	101	..	..	..
J. I. Case pfd	80	88	87	90	..
Chalmers Motor Co. com	91	94	155	160	+5
Chalmers Motor Co. pfd	95	98	98	99½	+9
Chevrolet Motor Co	..	..	216	216½	+11
Electric Storage Battery Co	49½	51	60	63	+2
Firestone Tire & Rubber Co. com	490	..	830	860	+10
Firestone Tire & Rubber Co. pfd	110	112½	113	114	+1
General Motors Co com	128	129	460	480	+35
General Motors Co. pfd	97	98	118	119	—1½
B. F. Goodrich Co. com	40	42	77¾	78¼	+ ¾
B. F. Goodrich Co. pfd	101	102	115	115½	+1
Goodyear Tire & Rubber Co. com	244	248	380	385	—5
Goodyear Tire & Rubber Co. pfd	105	106½	105½	106¼	—3½
Gray & Davis, Inc., pfd	..	..	..	..	..
International Motor Co. com	12¼	13½	7	12	—2
International Motor Co. pfd	31	32	21	29	+1
Kelly-Springfield Tire Co. com	131	134	74¼	75	+1¾
Kelly-Springfield Tire Co. 1st pfd	83	86	97	99	+1
Kelly-Springfield Tire Co. 2nd pfd	130	140	..	..	..
Maxwell Motor Co. com	36	38	85½	86	+3½
Maxwell Motor Co. 1st pfd	78½	80	89½	90	+3⅛
Maxwell Motor Co. 2nd pfd	30	32	59	59¼	+ ¼
Miller Rubber Co. com	180	188	255	270	..
Miller Rubber Co. pfd	104	105	115	..	..
New Departure Mfg. Co. com	106	..	217	221	+27
New Departure Mfg. Co. pfd	136	141	112	..	..
Packard Motor Car Co. com	103	..	165	170	..
Packard Motor Car Co. pfd	99½	..	100	104	..
Paige-Detroit Motor Car	..	..	750	850	..
Peerless Motor & Truck Corp	..	..	23½	24½	+ ½
Portage Rubber Co. com	35	38	85	88	..
Portage Rubber Co. pfd	85	88	107½	108½	..
Regal Motor Co. pfd	..	..	18	25	..
*Reo Motor Truck Co	14½	15½	29½	30½	+1
*Reo Motor Car Co	31	33	42½	44	+3¼
Splitdorf Electric Co. pfd	..	..	..	..	..
Stewart-Warner Speed. Corp. com	60	63	87	88	+2
Stewart-Warner Speed. Corp. pfd	102	104	109	..	..
Studebaker Corp. com	61	63	141	142	+8½
Studebaker Corp. pfd	97	99	109	112	+2
Swinehart Tire & Rubber Co	80	90	83	84	..
Texas Co.	121	123	192	194	+2
U. S. Rubber Co. com	60	61	55½	56	+2
U. S. Rubber Co. pfd	104	106	107	109	+2¼
Vacuum Oil Company	194	197	237	245	..
White Motor Co. (new)	..	..	49	51	..
Willys-Overland Co. com	109	111	264	270	+36
Willys-Overland Co. pfd	98	100	107	109	+3

*Par value $10.

OFFICIAL QUOTATIONS OF THE DETROIT STOCK EXCHANGE

ACTIVE STOCKS

	1915 Bid	1915 Asked	1916 Bid	1916 Asked	Net Ch'ge
Auto Body Co	..	..	31	..	..
Chalmers Motor Co. com	..	92	158	160¼	—3¾
Chalmers Motor Co. pfd	95	98	..	100½	—1
Continental Motor Co. com	175	185	36½	37½	+ ¼
Continental Motor Co. pfd	83½	85½	..	10¼	..
Ford Motor Co. of Canada	700	..	390	410	+15
General Motors Co. com	128	130	415	..	..
General Motors Co. pfd	98	100	115½	118½	—1½
Maxwell Motor Co. com	35	39	83½	86½	— ¾
Maxwell Motor Co. 1st pfd	76½	78	88¼	91	+2
Maxwell Motor Co. 2nd pfd	31	32½	56	60	—1½
Packard Motor Car Co. com	103	105	185	..	..
Packard Motor Car Co. pfd	98	100½	100	104	..
Paige-Detroit Motor Car Co	..	..	950	1050	+175
*Reo Motor Car Co	32¼	33¼	43	44	+4
*Reo Motor Truck Co	14¾	15½	29¼	30¼	+1¼
Studebaker Corp. pfd	..	100	107	..	..
Studebaker Corp. com	61½	63½	134	137	+2¾

INACTIVE STOCKS

*Atlas Drop Forge Co	..	26	..	40	..
Kelsey Wheel Co	195	..	..	350	—15
*W. K. Prudden Co	19½	21	33¾	35¼	+2¾
Regal Motor Car Co. pfd	..	25	16	..	..

*Par value $10.

N. A. A. A. J. Holds Convention

New Standards of Business Practice Established and Reforms Instituted

HOT SPRINGS, VA., May 12—The National Assn. of Automobile Accessory Jobbers, a year old yesterday, closed its spring convention to-day after having instituted a number of reforms and set up a number of new standards for business practice.

The convention began Tuesday with committee meetings, which lasted Tuesday and Wednesday, and the general sessions were held Thursday and to-day, concluding at 1 o'clock this afternoon.

A number of additions were made to the list of jobbers that the association has prepared and several members were admitted to the organization. In order to carry out the reforms it has in mind, the association plans to employ an investigator, who will devote his time to securing necessary information. In the past Commissioner W. M. Webster has handled practically all of this detail, but with the growth of the association it is becoming too voluminous. The organization is in good financial condition, having $18,378.20 in the treasury.

Unethical Business Practices

The members were of the sentiment that it is not ethical business practice for a manufacturer to duplicate the product of another manufacturer who has spent money and effort in developing the product and building up a business in it. It was recognized that there are exceptional situations and that duplication may, in many cases, be legitimate, but the action of the association was aimed at piracy and guerilla warfare in business. The practice of cashing in on the advertising of the pioneer and doing no legitimate development or advertising was condemned.

The methods of manufacturers who send threatening letters to the trade in advance of any definite situation in patent litigation were condemned, and it was recommended to members that they do not follow this practice.

Advertising Problems

Advertising in the house organs of other manufacturers was considered unwise and injudicious and certain members said that they could see that harm came thereby to even the publisher of the house organ himself.

The sending of collect telegrams has in some quarters become an abuse, and the association recommended that the practice be restricted. Paying for these telegrams was said by one member to be nothing more than a cut in price.

Drawing parallels in advertising was construed as unethical business practice, and it was recommended that members avoid the use of any names in these comparisons. L. C. Reed of the Chamber of Commerce of the United States addressed the convention on the work of the organization he represents, and the jobbers voted to affiliate with the chamber.

Vice-President Joseph Bloch of the Gibson Co., Indianapolis, Ind., delivered an address on business practice.

A Credit Bureau

A credit adjustment bureau is to be established, the object of which will be to disseminate information regarding unsafe accounts.

Greater co-operation between the jobbers and the Motor and Accessory Manufacturers is to result from conferences which have been held and regarding which a report was made to the convention by President Sydney B. Dean, St. Paul.

The next convention is to be held in St. Louis the first week in October, and the dates probably will be Oct. 2, 3, 4 and 5. A committee was appointed to assist the retailing division of the trade in establishing better business methods and deriving greater profits from the retailing business. The chairman is H. R. Williams of the Gibson Co.

The traffic committee recommends a standardization of certain shipping packages, and plans to have parts and accessories entered in some freight classification, after which any rate adjustments will be taken up. At present the majority of accessory merchandise is classified as "Not Otherwise Specified."

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Examinations for Special Agents

WASHINGTON, D. C., May 12—The date of examinations for special agents of the government to investigate the markets for motor vehicles in China, India, East Indies, Africa, and Australia has been set for May 19.

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K. C. Dealers Find No Need for Used Car Auction Show

KANSAS CITY, MO., May 13—The Kansas City Motor Car Dealers' Assn. has abandoned its plans for holding an auction show for used cars—the committee appointed to investigate reporting that there was little occasion for such an event.

"The committee found that there is a comparatively small number of used cars in the city; that the advance in price and the scarcity of new cars have caused a stiffening of prices on the used cars, and that little could be gained by an auction and show," said Will Brace, president of the association.

Twelve Entries for Chicago

De Palma, Resta, Chandler, Johnson and Lewis on List for Derby

CHICAGO, ILL., May 16—*Special Telegram*—The class of the field for the Chicago Derby, June 10, has been heightened by the entry of DePalma, Resta and Oldfield to-day with DePalma's Mercedes, Resta's Peugeot and Oldfield's Delage. Three Crawfords also came in to be driven by Billy Chandler, Arthur Johnson and Dave Lewis. This brings the entry list up to twelve, and it is expected that before the entries close there will be in the neighborhood of forty cars named for the board track event.

If it is true that Barney Oldfield is to retire this year he will not go back to private life without having made an attempt to capture this race as a crowning glory and a fitting finish to a career which has been one of the most sensational in the annals of racing. Oldfield has announced his intention of accepting the challenge of David F. Reid, president of the Chicago Speedway Assn., who, as announced last week, has offered $1,000 to the driver who will break the world's 2-mile speedway record, with an additional $1,500 if better than 2 miles per minute.

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$12,000 for Indianapolis Winner

INDIANAPOLIS, IND., May 15—Prize money totaling $30,000 in cash will be competed for at the coming race meet on the Indianapolis Speedway May 30. There will also be intermediate trophies added. The winner will receive $12,000; second, $6,000; third, $3,000; fourth, $2,000; fifth, $1,700; sixth, $1,400; seventh, $1,200; eighth, $1,000; ninth, $900, and tenth, $800.

Three Trophies

The trophies will be the Remy Grand Trophy and the Remy Grand Brassard, which will be awarded the driver of the car leading at 100 miles; the Prest-O-Lite Trophy, which will be awarded the driver leading at 200 miles, and the Wheeler-Schebler Cup, which will be awarded to the leader at the 250-mile post.

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Six Events for Tacoma May 30

TACOMA, WASH., May 15—Six events are scheduled for the Decoration Day Tacoma Speedway race meet. Event No. 1 will be a 20-mile race for cars of 600-cu. in. displacement or under. First prize will be $75; second, $50; and third, $25. Event No. 2 is an outdoor auto-

mobile show and parade. Event No. 3 is a 10-mile race for cars of 230-cu. in. displacement or under. First prize is $50; second, $35; third, $15. Event No. 4 is a 30-mile race for cars of 600-cu. in. displacement or under. First prize is $125; second, $75 and third, $50. The other two events are a backing contest for women drivers and a women's exhibition driving contest for three laps of the track, approximately 6 miles.

For July 4 the Tacoma Speedway Assn. is arranging a program which will consist of one event for non-professional drivers, along the lines of the Chicago event on May 20. Besides this, there will be a match race between Ulysses Aubry, in a Tacoma-built car, and James Parsons of Seattle in a Stutz. This race will be put on in three heats, the first two being 35 miles each, and, if a third is necessary, it will be for 30 miles. The prize for this race will be $1,000.

For Aug. 5, there will be a 300-cu. in. race for 300 miles, with a purse of $10,000.

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Two Trophy Races Scheduled for Twin City Track

MINNEAPOLIS, MINN., May 13—Entry blanks for the Memorial Day races at the Twin City Motor Speedway, Sanction No. 295, show two trophy races and altogether about $3,000 in purses. Motorcycle races are scheduled and an appearance of Ruth Law, woman aviator. The program is as follows:

No. 1. Class C, Div. V—Non-stock, 161-230 cu. in., 10 miles: $150, $75, $50, $25.
No. 2. Class C, Div. VI—Non-stock, 231-300 cu. in., 20 miles: $150, $75, $50, $25.
No. 3. Class E, Non-stock—Special, 10 miles, roadsters and touring cars, factory equipment, except tops, lamps, mud guards and windshields, for members M. S. A. A., *Daily News* troply, one year.
No. 4. Class D. Non-stock—Free-for-all, 50 miles: $1,000, $500, $200, $150, $100, $50.
No. 5. Class E, Non-stock—Special, Twin City racing cars, drivers and entrants, 10 miles. "Twin City" trophy, permanent when won third time by representative of same city.
No. 6. Non-stock—Free-for-all handicap, open to cars competing in one event of the day, 10 miles: $150, $75, $50, $25.

The management of the speedway is having the joints and rough spots rubbed down, and drivers who contested in the first race last year that have driven over the track this year find the concrete has weathered the winter well and that the course is in much better condition even than last fall.

Prices Are Lower

High prices that worked against a good attendance at the initial race, and which were criticized strongly, have been reduced. Fifty cents is general admission with bleacher seat. Automobiles will be parked free behind the stands with $1 charge for each occupant of cars parked in the circle inclosure and $1 for the car. Seats for the wire grandstand are $1 each, no charge for accompanied children under twelve.

Hupp Has School for Dealers

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Most Practical Ways of Taking Care of All Adjustments to Be Taught

DETROIT, MICH., May 13—The Hupp Motor Car Co. has inaugurated a free educational course for Hupmobile dealers, service representatives and repairmen with the aim of informing them of the best and most practical ways of taking care of adjustments which necessarily come up in the use of an automobile. The course is in the nature of a correspondence school idea, and in the preparation of the plan, the Hupp concern has engaged the services of Claude Wadsworth, who originated, prepared and conducted the International Correspondence School Automobile shop course.

Eighteen instruction papers on automobile construction in general and Hupmobile construction in particular have been prepared by Mr. Wadsworth. The subjects to be taught cover every phase of car design, and will be presented in a concise form so they will be clear to the layman. Subjects to be dealt with cover: Automobile troubles; electric starting and lighting systems; ignition; carbureters; repair and adjustments; oxy-acetylene welding; automobile machine shop practice; automobile power plants; cooling and lubricating systems; clutch, control and change-speed mechanisms; tires; driving, assembly; factory work; materials; accessories; salesroom and garage management; data sheets, etc.

Twice during the year a series of questions will be sent to every student who enrolls and suitable prizes will be given those having the highest standing. In addition to the prizes offered, every man who passes the examination with 75 per cent or over will receive a certificate of efficiency from the Hupp company, which will serve as a recommendation for future employment.

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Holds New York City Owners' License Bill Discriminatory

ALBANY, N. Y., May 16—Governor Whitman said to-night that he would not sign Assemblyman Kelly's bill, which would require every New York City owner of an automobile who operates his own car to take out an operator's license. Attorney General Woodbury told the Governor that the bill was unconstitutional. Its discrimination between persons, he said, amounted to a denial of the equal protection of the laws guaranteed by the Constitution. In his opinion Mr. Woodbury says:

"No owner of a motor vehicle whose residence is in New York City is permitted to operate or drive it unless he takes out a license. There being no restriction as to the place of operation, it would follow that he could not operate or drive it anywhere in the State without such a license, solely because of his place of residence. Upon the other hand, under the language of the act, any owner of a motor vehicle whose residence is outside of New York City may operate and drive it anywhere in the State, even in New York City, without a license, because no license is required of him.

"The right to operate and drive a car by its owner, with or without a license, is made to depend solely upon the owner's place of residence without regard to the place of operation. Thus people who are residents of New York City are discriminated against in the matter of this license requirement."

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Reciprocity for New York and Canada

ALBANY, N. Y., May 13—Automobile license reciprocity between New York State and the Canadian province of Ontario will become effective within a few days as the result of the approval by the Ontario Cabinet to-day of the license exchange plan proposed to the provincial authorities some time ago.

Up to the present, New York automobilists have been obliged to take out an Ontario license before crossing the international boundary, and Ontario motorists were required to obtain a New York permit before they could bring their cars into the State.

Under the plan ratified by the provincial Cabinet to-day reciprocal rights to operate automobiles in each other's territory for a twenty-one-day period will be granted New York and Ontario motorists.

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10,112 Cars in Quebec

MONTREAL, QUE., May 12—The returns prepared by the Automobile Bureau of the Provincial revenue for the year ending April 1, show that there were, up to that time 10,112 automobiles registered in the Province of Quebec. In past years nearly 75 per cent of the total number licensed were registered in the district of Montreal, but the figures for the past year indicate that the number of automobiles is much more evenly divided over the whole province than formerly.

Of the total of 10,000 in the province there are 8082 touring cars, 1055 run, abouts, 296 motorcycles, 132 limousines, 528 trucks, and nineteen surries. With the exception of eight propelled by steam and thirteen by electricity, all are driven by gasoline motors. In the districts of Montreal there are 4058 touring cars, six surries, 631 runabouts, 173 motorcycles, 121 limousines, and 425 trucks, most of the heavy commercial vehicles thus being employed in the city and district. Only one steam car and eight elec-

tric cars are operated, all the rest being gasoline driven.

Last year in the province there were 6825 passenger cars, 384 commercial cars, 205 motorcycles, and 137 dealers cars licensed, making a total of 7550, an increase of over 2500 motor vehicles in the year. There were over 70,000 cars in all the provinces of the Dominion. Ontario having five times as many cars as any other province. The figures for the last year just ended are not yet completed, but it is believed that the grand total of automobiles and motorcycles in the Dominion is not far short of 100,000 at present.

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Expect 115,000 Registrations for Wisconsin This Year

MILWAUKEE, WIS., May 13—When the Secretary of State of Wisconsin issued license No. 79,790 on May 9, the total number of licenses issued during the year 1915 was equalled. Since then more than 4000 licenses have been issued, and by the end of May it is expected that the Wisconsin private owners' registry will have reached the 90,000 mark.

There seems to be no question that the 1916 registration will total 115,000, which would be approximately 35,000 in excess of 1915.

On March 1, the number issued was 21,000; on March 1, 1916, the number was 38,500. The figures for April 1 are: 1915, 30,000; 1916, 50,500. Thus it will be seen that during April alone, more than 25,000 cars were licensed. Dealer's licenses also show a large gain, the number issued on May 1 being 1745. The total revenue from automobile and cycle licenses for the first four months of 1916 was $406,557.

In 1912 the total registration of Wisconsin was 24,578. This number was passed on April 29, 1913. The 1913 total was 34,646, which figure was passed April 26, 1914. The 1914 total of 53,160 was passed April 26, 1915, and the 1915 total of 79,790 was passed May 9, 1916.

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161,564 Registrations in Pennsylvania

YORK, PA., May 12—Revenue from automobile registration this year has passed the $1,700,000 mark and officials of the automobile division of the Pennsylvania State Highway Department believe that $2,000,000 will be reached. The total revenue for 1915 amounted to $1,665,276. The number of automobile registrations up to date are 161,564. It is believed that the total number will reach 250,000.

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Robbins Pullman District Mgr.

DETROIT, MICH., May 10—P. L. Robbins, for two years connected with the sales department of the Paige-Detroit Motor Car Co., has been appointed district sales manager of the Pullman Motor Car Co., York, Pa., with headquarters in San Francisco.

Des Moines Business $12,000,000

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$2,000,000 Average Stocks Carried by Car and Accessory Dealers

DES MOINES, IOWA, May 12—The annual volume of business done by the automobile trades industry of Des Moines is approximately $12,000,000, according to statistics compiled by the Des Moines Chamber of Commerce. The statistics show that the value of the average stocks carried by car and accessory dealers of the Iowa capital city is $2,000,000; the capitalization of the industry in Des Moines is $1,900,000; the number of men employed is 1000, and that the total of wages paid annually is $1,000,000.

The number of Des Moines concerns—corporations, companies, firms or individuals—engaged in the automobile industry is 111, and these are divided as follows: Cars, forty-three; accessories, thirty-seven; garages and repairs, twenty-one; oil, six; manufacturing, eleven. The classifications show some duplications, since some concerns are engaged in more than one line of business connected with the motor industry.

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13,352 Cars Registered in California in April—171,755 in State

SAN FRANCISCO, CAL., May 3—The total number of cars registered in April was 13,352 against 8,321 for March. Five thousand and thirty-one more automobiles were registered in California during April than in March and the income to the State was $9,993.10 more.

The total receipts of the department to date are $1,857,492, and the total number of cars registered in California is 171,775.

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Driver Liable for Damages

OMAHA, NEB., May 12—By a decision of the Nebraska supreme court, reversing that of the district court, the driver of a car concerned in an accident, who is at the time violating the provisions of the statutes, becomes liable for damages sustained by an innocent victim, even though such liability is not mentioned in the statutes.

The decision came in a case where a sixteen-year-old boy, driving his father's car at a reckless pace, collided with another machine, damaging it and injuring the driver.

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Big Mileage by Maxwell Abroad

LONDON, ENGLAND, May 5—The performances of a Maxwell car in a series of mileage tests conducted recently at the Brooklands track near London during experiments with a new motor fuel were so satisfactory as to attract much attention. A mileage as high as 33.6 miles per gallon was obtained. Another test in which fuel of a different mixture was used resulted in a mileage of 32.8 miles. Hill climbing tests were made also. The purpose of the demonstrations was to determine the efficiency of Economee, which is a mixture of a heavy grade vaporizing oil and ordinary gasoline.

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Driving Without License Does Not Preclude Damage Claims

MILWAUKEE, WIS., May 14—Operating an automobile without a license does not preclude claims for damages in accident cases, according to the decision of the supreme court of Wisconsin in the suit of Eugene H. Derr against the Milwaukee road. Derr's car was struck by a train on Jan. 30, 1915. He was awarded $900 damages by a circuit court jury. The court in a memorandum found that Derr was illegally operating his car because he carried a 1914 license in 1915. This virtually set aside the verdict and Derr appealed to the supreme court, which says: "We find nothing in the statutes to indicate that the legislature intended to deprive a person who is injured while driving an unregistered car of the protection accorded to other travelers. To bar such an injured person from invoking his rights, it must appear that his violation of the law was a proximate cause of the injury." Judgment is ordered in favor of Mr. Derr as originally ordered by the jury.

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4331 Cars in Denmark

COPENHAGEN, DENMARK, May 5—The number of automobiles in Denmark on Sept. 1, 1915, was 4331, with a combined horsepower of 35,229, as against 3430 machines at the corresponding period in 1914, with a total horsepower of 28,122. The first statistical information published by the Kingdom in regard to automobiles was in 1909, when there were only 682 machines in the country. Of the number of machines 3773 are for personal use. This number includes 1291 used for cab or omnibus service. Motor trucks number 558.

There were also on Sept. 1, 1915, 6347 motorcycles in use.

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Twenty Pullman Cars Captured

YORK, PA., May 12—Word was received in this city several days ago that twenty touring cars, manufactured by the Pullman Motor Car Co., were on board a ship bound for Sweden which was captured by a man-of-war the other day. The steamer and crew were taken into port as a prize of war.

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Track Race for Havana May 20

NEW YORK CITY, May 15—A race meet is scheduled for Havana, Cuba, on May 20 on a one-mile dirt track. Prizes will amount to $15,000.

Factory Miscellany

J and D Tire to Build—The J and D Tire & Rubber Co., Charlotte, N. C., will construct a two-story factory.

Oklahoma Tire Co. to Build—The South Western Tire Mfg. Co., recently incorporated in Oklahoma City, Okla., is planning to construct a plant which will cost about $200,000.

Akron to Build—The Akron Airless Tire Co. will construct a plant at Akron, Ohio, which will cost about $150,000.

To Make Signals—A plant for the manufacture of automatic automobile signaling devices will be equipped at Kansas City, Mo., by the Signalite Mfg. Co., recently incorporated.

Lancaster Tire to Enlarge Plant—The Lancaster Tire & Rubber Co., Lancaster, Ohio, will enlarge its plant. The estimated cost is $60,000.

Pearce Tire Plant Progressing—Work on the new plant of the Pearce Tire & Rubber Co., Ashtabula, Ohio, which is being erected at the foot of Benefit Street, is being rushed to completion. The factory will be two stories, 76 by 180 ft. The building will be absolutely fireproof, modern reinforced concrete, and faced with brick between the floors.

Detroit Crank Builds—The Detroit Auto Crank Co., Detroit, Mich., is to build a factory on Piquette Avenue.

Simplex Adds Foundry—The Simplex Automobile Co., New Brunswick, N. J., has awarded contracts for a new aluminum foundry.

Wis. Factory News—The Gas Traction Foundry Co., Minneapolis, Minn., is installing a 2-ton open-hearth furnace designed by David McLain, Goldsmith Building, Milwaukee, who recently started to make installations. The first is a 2-ton unit in the Sivyer Steel Casting Co., Milwaukee, a large producer of automobile castings for the manufacturing trade. The McLain furnace makes it possible to take five heats, or 10 tons, in 12 hr. The Sivyer company has made more than 200 heats in one month without relining or repairs of any kind.

The Gerlinger Steel Casting Co., West Allis, Milwaukee, a large producer of motor truck castings, is installing a 1½-ton Snyder electric steel furnace to replace a ½-ton unit installed for trial and demonstration purposes early this year. The experiment was so successful that a larger furnace has been found necessary to handle this class of business.

Vacuum Oil to Build—The Vacuum Oil Co. has purchased over 600 acres of ground at Lincoln Park, N. J., just opposite Philadelphia, and will build an oil refining plant, which, with piers, docks and trackage, is estimated to cost $3,000,000. The site was selected because of the large acreage, the condition of which is good, and because the Government is dredging that part of the Delaware River on which it is located. Three large tank ships are being built.

Capital Glass Begins Operations—The Capital Glass Co., Lansing, Mich., has begun operations here and will specialize in automobile glass.

Davis to Build—A. E. Davis, 258 East 138th Street, New York City, has drawn plans for a plant, 72 by 135 ft., to be used for the manufacture of automobile accessories. It will cost about $65,000.

American Trimming Co.'s Plant—Plans are being prepared for a five-story, 94 by 255-ft. factory for the American Auto Trimming Co., Berlin and Meldrum Street, Detroit, Mich. The estimated cost is $125,000.

McLean Tire Production Progressing—Officials of the McLean Tire & Rubber Co., Cleveland, Ohio, who are also officials of the M. & M. Co. of this city, said that the factory in East Liverpool has now been in operation two weeks and that the product is coming through in good shape. It is expected that the factory will be well up to capacity within a short time. W. B. Davis, in charge of the sales, has closed contracts with distributors in Detroit, Pittsburgh and some other important points and the distribution end of the business will soon be well organized.

The Automobile Calendar

ASSOCIATIONS

May 18—S. A. E. New York Section, May Meeting.
May 22-26—Chicago, Ill., N. E. L. A. Convention, Electric Veh. Section, Congress Hotel.
May 26-27—Del Monte, Cal., Meeting, Three Divisions of National Assn. of Automobile Accessory Jobbers.
June 12-16—S. A. E. Summer Trip on Great Lakes.
July 2-6—Detroit, Mich., World's Salesmanship Congress, Detroit Board of Commerce Bldg.
Dec. 2-9—Electricians' Country-wide Celebration.

CONTESTS

May 20 — Chicago Non-Professional Speedway Race, Western Interclub Speedway Park.
May 30—Des Moines, Iowa, Iowa Derby, 20 miles; Des Moines Special, 10 miles.
May 30—Tacoma, Wash., 10, 20, and 30-Mile Races, Tacoma Speedway Assn.
May 30—Elmira, N. Y., Track Race, Elmira Auto & Motorcycle Racing Assn.
May 30—Indianapolis Speedway 300-Mile Race.
May 30 — Minneapolis, Minn., Speedway Race.
June 4—Sheepshead Bay Speedway, 30-mile Race, American Liberty Day Committee.
June 10 — Chicago Speedway Race, International 300-Mile Race, Speedway Park, Speedway Park Assn.
June 16-17 — Sheepshead Bay Speedway, 24-Hr. Race, Trade Racing Assn., New York City.
June 20—Galesburg, Ill., Track Race, 100 miles.
June 28—Des Moines, Iowa, Speedway Free - for - All, 300 Mile Race.
July—LaGrande, Ore., Track Race, LaGrande Motor Club.
July 4—Coeur d'Alene, Idaho, Race Meet, Hiller-Riegel Co.
July 4—Tacoma, Wash, Speedway Race, Tacoma Speedway Assn.
July 4—Minneapolis 300 - Mile Speedway Race.
July 4—Sioux City Speedway Race.
July 15—Omaha, Neb., Speedway Race.
July 15—North Yakima, Wash., Track Race, Hillier-Riegel Co.
Aug. 5—Tacoma Speedway Race, Tacoma Speedway Assn.
Aug. 11-12—Pikes Peak, Col., Hill Climb, Pikes Peak Auto Highway Co.
Aug. 12—Portland, Ore., Track Race, Hillier-Riegel Co.
Aug. 18-19—Elgin Road Race, Chicago Auto Club.
Sept. 4—Des Moines Speedway Invitation Race. Limited to six entries.
Sept. 4—Indianapolis Speedway Race.
Sept. 4-5 — Spokane, Wash., Track Race, Inland Auto Assn.
Sept. 16—Providence Speedway Race.
Sept. 29—Trenton, N. J., Inter-State Fair. H. P. Murphy, Racing Sec.
Sept. 30 — New York City, Sheepshead Bay Speedway Race.
Oct. 7—Philadelphia Speedway Race.
Oct. 7—Omaha Speedway Race.
Oct. 14—Chicago Speedway Race.
Oct. 19—Indianapolis, Ind., Race, Indianapolis Motor Speedway.
Nov.—Santa Monica, Cal., Vanderbilt Cup and Grand Prix Races.

GOOD ROADS

May 14-20—Milwaukee, Wis., Sheridan Road Week to Complete Highway Connecting Milwaukee and Chicago.
May 25—Pennsylvania's Second Good Roads Day.
Sept. 6-7—St. Paul, Minn., Good Roads Congress, Auditorium.

MISCELLANEOUS

June 8—New York City, Orphans' Day Outing at Donnelly's Grove, College Point, L. I. Orphans' Automobile Day Outing Assn.

SHOWS

Sept. 2-9—Columbus, Ohio, Fall Show, Ohio State Fair, Columbus Automobile Show Co.

TRACTOR

July 17-21—Dallas, Tex., Tractor Demonstration.
July 24-28—Hutchinson, Kan., Tractor Demonstration.
July 31-Aug. 4—St. Louis, Mo., Tractor Demonstration.
Aug. 7-11—Fremont, Neb., Tractor Demonstration.
Aug. 14-18—Cedar Rapids, Iowa, Tractor Demonstration.
Aug. 21-25—Bloomington, Ill., Tractor Demonstration.
Aug. 28-Sept. 1—Indiana Tractor Demonstration.
Sept. 4-8—Madison, Wis., Tractor Demonstration.
Sept. 11-16—Milwaukee, Wis., Fall Show, Wisconsin State Fair, Milwaukee Automobile Dealers.

The Week in the Industry

Iowa News—N. B. Robbins leaves the Double Tread Tire Co., Des Moines, for Fort Sam Houston, Texas, where he is mechanical superintendent of the school of instruction for the government aviation corps which is training flyers for the army work in Mexico.

An Iowa branch of the Studebaker Corp., Detroit, has been established in Des Moines with temporary headquarters on the second floor of the Schee Building, Fifth and Court Avenue. H. A. Haskell is general manager and H. H. Brown is in charge of the office. Repairs to the number of 50,000 are on hand for service to Iowa-owned Studebakers. A five-story building with a floor capacity of 87,120 sq. ft. will be built for permanent headquarters and as an assembling plant in Iowa for Studebaker cars. Site options have been secured.

The Ford Motor Co., Detroit, has bought a site for a branch factory in Des Moines and plans for the construction work are now in progress. It will be located at Nineteenth Street and Grand Avenue, near the center of the city and on trackage. A frontage of 233 ft. on Grand Avenue is afforded. The building is to be six stories high and will have half a million feet of floor space with a show room on the first floor and a front of architectural beauty to face the avenue. A force of between 250 and 300 men will be employed and the $5 a day, profit-sharing wage plan of the mother factory will be in force. The Herring Motor Co., Iowa Ford distributor, will continue to occupy its present location in a fine, large building recently constructed.

California News Items—The Master Carburetor Co. of California, Los Angeles, out of which grew the Master Carburetor Corp. of Michigan, has been merged with the organization of the East. The scope of the Los Angeles house will remain practically unchanged. The local branch acts as Pacific Coast distributer, taking care of the trade as far east as Denver. C. G. Harness, who has been in charge of the affairs of the local house for the past year, remains as manager of the Los Angeles branch.

C. S. Anthony, Los Angeles, one of the pioneers of the automobile industry in California, has been appointed Southern California and Arizona distributer of the Signal truck. The commercial vehicle will be carried in conjunction with the Glide line which has been controlled by Anthony in California for the past year.

Trade Happenings

E. J. Bennett, Los Angeles, has been appointed sales manager of the Empire Motor Sales Co., Los Angeles. Bennett has been in the automobile field in Southern California for more than ten years. In 1905 he had the agency for the Wayne and Peerless and was located on Seventh and Broadway, which is the very heart of the business center of the city to-day.

The Stone-Pierce Dancy Motor Sales Co., 1911-13-15 West Seventh Street, Los Angeles, has taken over the Kelly-Springfield motor truck as distributor in Southern California and Arizona. In addition to the truck agency, the company operates a service station, and a feature of the garage is a set of lock stalls for the storage of privately owned touring cars. The keys to these lock stalls are turned over to the patrons, who know their cars will not be tampered with and that they will not be backed into by other cars in the garage.

New England Trade Items—An agency for the Scripps-Booth line has been placed at Springfield, Mass., with the Springfield Automobile Co.

C. W. Woodbury has been placed in charge of the new Packard annex for trucks and used cars at Providence, R. I.

T. F. Russell has taken the agency for the Inter-State line at Springfield, Mass.

The Gilson Auto Co., agent for the Mitchell at Portland, Me., has just moved into new salesrooms under the Lafayette Hotel, in the heart of the city.

W. C. Goodchild, for some years at the Metz factory, has been promoted to take charge of the Providence (R. I.) branch of the company.

G. Lawrence Ertz, for a long time at New Haven, has accepted a position with the Boston (Mass.) branch of the Locomobile Company, handling Riker trucks.

M. D. Stebbins has taken the Bell line for central Massachusetts, with headquarters at Springfield.

Pugh Brothers have taken the Bessemer truck line for Rhode Island, with headquarters at Providence.

The New England Whip Co., of Westfield, Mass., that has the New England distribution of Munroe cars, has opened salesrooms at Boston at 926 Commonwealth Avenue.

J. J. McCarthy, who looks after Lozier interests at Boston, Mass., has taken on the Ross car for that city.

F. H. Chapman, who has handled the Ford line in central Massachusetts for the past two years, has received word that the factory intends to make Springfield, Mass., a factory distributing center for that territory beginning next November. The company intends to erect a service station to take care of the business in the section for a radius of some miles. With the big Overland service station here it will make Springfield a big motor distributing center for small cars.

Northwest Items—The Chandler line of machines is again established in the State of Oregon; the Gerlinger Motor Car Co. has secured the agency for Portland, the State of Oregon and ten southern counties of State of Washington.

P. A. Berry has been appointed sales manager of the Premier Motor Car Co., Indianapolis, on the Pacific Coast and Hawaii, and will have offices in San Francisco. Mr. Berry was formerly sales manager of Pacific Car Co., Tacoma, Wash.

R. E. Pemberton, manager Northwest Auto Supply Company, Spokane, has secured the agency for the Empire line for the Inland Empire.

Lewiston Hardware Co., Lewiston, Idaho, has secured the agency for the Chevrolet line and opened a garage and service station.

William Gollehon and C. E. Moore of Colfax, Wash., have formed a partnership to handle the Overland and Willys-Knight lines in Whitman County.

Riouth & Johnson, Colville, Wash., have taken the agency for Saxon line.

The Portland Tire Store has opened in Portland, Ore., and will handle Blackstone tires. R. F. Strong is manager.

Marko Establishes N. Y. Branch.—The Marko Storage Battery Co., Bedford Avenue, Brooklyn, has opened a branch at 974 Eighth Avenue, New York, under the name Marko Storage Battery Depot of New York, Inc.

Brown with Scripps-Booth—W. I. Brown, former supervisor of districts for Dodge Bros., has been appointed assistant sales manager of the Scripps-Booth Co.

Takes on Metz in Owensboro—The Ames Motor Car Co., Owensboro, Ky., with A. Reis Meyer as sales manager, has been appointed distributor for the Metz 25 five-passenger touring car and roadster, for Kentucky and Southern Indiana.

Mr. Meyer will also have charge of the sales and distribution of the Ames motor car and motor car accessories.